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COMPUTERWORLD

Messaging mergers shake up IS plans

By Lynda Radosevich

Users will face tougher messaging choices in the coming months as mergers and acquisitions shake up the fast-growing client/server messaging arena and onetime neutral players team up with highly partisan factions.

Hot on the heels of several major consolidations this year, Lotus Development Corp. last week snapped up messaging integration vendor SoftSwitch, Inc. in Wayne, Pa. SoftSwitch sells Central and EMX, which are mainframe and Unix-based switches that permit large organizations to integrate disparate LAN- and mainframe-based electronic-mail systems.

Upping the ante

Together with the recently completed Novell, Inc./WordPerfect Corp. merger and others, the move raises the stakes for information systems managers just as many are making plans to migrate mission-critical messaging systems off mainframes. For instance, the Lotus acquisition of SoftSwitch may force some users to choose

Messaging, *page 16*

ATM ramps up

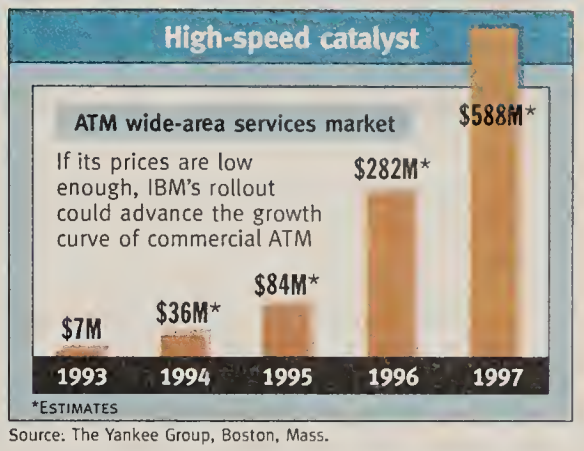
IBM offerings expected to plug gaps in current ATM nets

By Stephen P. Klett Jr. and Elisabeth Horwitt

IBM will unveil next week the core pieces of its strategy to deliver an end-to-end Asynchronous Transfer Mode internetwork, according to sources close to the company. Analysts said the products could advance commercial adoption of ATM by as much as two years.

Specifically, IBM will unwrap its much-ballyhooed ATM software architecture, called Broadband Network Services. It is designed to plug the interoperability, protocol transport and congestion control gaps found in current ATM networks.

Sources briefed on the announcement said IBM will also unveil the various hardware pieces needed to run BBNS, including 25M bit/sec.



Source: The Yankee Group, Boston, Mass.

ATM adapters, concentrators and switches. All of the products are expected to ship by the fall.

For example, IBM will detail its Transport Network Node family of switches, including modules to upgrade existing IBM 8250 hubs to IBM 8260 hubs with ATM support, as well as a wide-area access switch that the company announced last year [CW, July 19, 1993].

Together, these products could represent a major step forward in current ATM capabilities and are vital for IBM's recognition as a promi-

ATM, *page 15*

UNDER THE GUN

REID HORN

Workplace violence last year led to 110,000 assaults and more than 1,000 murders. Such alarming statistics have led security managers like Scot Lins of Southland Corp. to use technology to protect employees and customers.

See Management, page 105.

FDA seeks Rx for radio wave ills

By Mitch Betts
WASHINGTON

Stray radio waves from wireless communications devices are scrambling the electronic guts of life-saving medical devices with frightening—and sometimes fatal — results, according to hospital engineers and the Food and Drug Administration.

The FDA last week said it will beef up its regulation of microprocessor-controlled medical devices to ensure they can resist common sources of electromagnetic interference. Reported problems include pump malfunctions, disabled alarms and incorrect monitor readings that shoot off the chart or produce a "flat-line" reading.

A handful of hospitals in Canada, Europe and the U.S. have already banned cellular phones because of electromagnetic interference when they are held close to such devices as incuba-

FDA, *page 157*

In one traumatic example of radio wave interference, a motorized wheelchair lurched suddenly into motion, raced downhill and over a cliff. The occupant suffered a broken hip.

Nightmare on Backup St.

By Mary Brandel

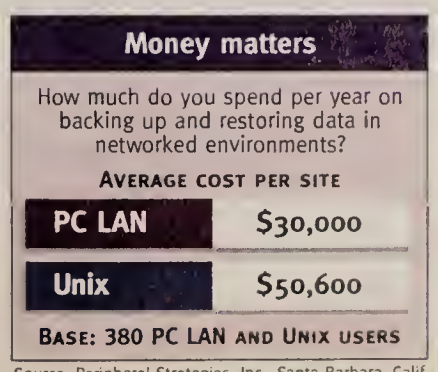
Adam Lynn's worst nightmare goes like this: He walks into work to find that an entire database crashed overnight while someone was working on the system. Although he had done a full backup, no critical files can be restored.

Can this happen? Indeed it can. There is no easy way today to back up open database files on a PC LAN.

In the nightmare, "we lose everything," said Lynn, a senior LAN engineer at Micro Research Industries in Alexandria, Va.

With more and more LAN applications requiring 24-hour uptime

Nightmare, *page 157*



Source: Peripheral Strategies, Inc., Santa Barbara, Calif.

Next faces IS doubts

By Kim S. Nash

Object technology was not in doubt when Dreyfus Corp. sought application development tools early last year for a major project to pull together its entire sales, marketing and customer service systems. It was the object technology provider — Next Computer, Inc. — that worried the $350 million financial services firm.

DAVID POWERS

Next CEO Steve Jobs: *'We were here first' with objects*

"Next impressed us by far [with] a phenomenal development environment, but we didn't feel comfortable that the vendor would be around for the long term," said Walter Wantman, systems consultant at Dreyfus' New York headquarters.

So Gupta Corp. got Dreyfus' business instead.

As recently as 12 to 18 months ago, Dreyfus and many other would-be corporate customers ran scared from Next. The vendor was losing money hawking a brand-new operating system on expensive proprietary hardware, and the company simply looked untenable, according to 15 users and analysts interviewed recently.

Today, however, Next is seen as a new and more stable entity.

Next, *page 28*

Newspaper

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What's Inside

June 20, 1994

JOHN RAE

In Depth

ONE on ONE with Jaron Lanier

VIRTUAL REALITY has a place in the IS world. VR guru Jaron Lanier envisions borderless, 360-degree screens for programming and the ability to tweak software by "holding" it in your hands. Our interview starts on page **128.**

NEWS

■ **Stray radio waves** from wireless communications devices are scrambling the electronic guts of life-saving medical devices with sometimes fatal results, according to hospital engineers and the Food and Drug Administration. *Page 1*

■ While the federal government maps out the interstate information highway, state governments are already building their own **digital state highways**. *Page 8*

■ The **PC price war** may have shifted to the server industry as several vendors announce substantial price reductions. *Page 14*

■ IBM adds two Micro Channel Architecture systems to its PS/2 family. At the same time, IBM drops prices on several other PS/2 models by as much as 20%. *Page 157*

COMPUTER INDUSTRY

■ **Long-distance companies**, joined by cable and wireless companies, are entering the local loop market and putting additional pressure on local telephone companies. That spells good news for customers. *Page 32*

DESKTOP COMPUTING

■ **Apple users** should have bountiful, lower-priced and faster graphics boards once Apple adds the Peripheral Component Interconnect bus to the Power Macintosh, which should happen early next year. *Page 41*

WORKGROUP COMPUTING

■ Most database vendors have **NetWare support**. *Page 69*

ENTERPRISE NETWORKING

■ When they finally arrive, **remote monitoring** facilities will be welcomed by users. Still, customers want to make full use of the stand-alone analyzers they already have. *Page 81*

LARGE SYSTEMS

■ **Client/server** pays off for Charles Schwab & Co. — literally. *Page 92*

APPLICATION DEVELOPMENT

■ Unless "human factors" are taken into account, a decision-support system may support only bad decisions, according to **Mitch Betts**. *Page 102.*

MANAGEMENT

■ Companies including Dallas-based Southland Corp. are using **technology** to protect their employees and customers. *Page 105*

IN DEPTH

■ **Virtual reality** has a place in the IS world in software development and network management, according to VR guru Jaron Lanier. *Page 128*

CAREERS

■ **Windows NT experts** will be in demand as the number of installed NT sites is expected to explode by 1997. *Page 138*

MARKETPLACE

■ Although a new generation of **Internet interfaces** is being rushed to market, critics say they don't address the fundamental challenge: knowing where and how to look for things on the Internet. *Page 148*

COMMENTARY

■ Fostering competition should be the Federal Communications Commission's bywords as the agency considers what to do in the telecommunications market, according to **Bill Laberis**. *Page 36*

■ Consultant-speak from **Tim Lynch**. *Page 37.*

■ AT&T's Bell Data Network lives — this time as the recently announced NetWare Connect Services, **John Gantz** opines. *Page 37*

■ Price Waterhouse may have been one of the losers in the recent Windows World Open contest, but the firm is winning big with its application development approach, according to **Charles Babcock**. *Page 6*

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Company Index ..... *Page 154*
Editorial/Letters to the editor ..... *Page 36*
Friday Stock Ticker ..... *Page 155*

Executive Briefing

E-mail rules. As Lotus buys gateway vendor Soft-Switch, Microsoft gets ready to unveil its next-generation mail server. With all this, users face even tougher choices than before. *Pages 1, 12 and 16*

Still ticking. There's life in the old mainframe yet, even as it is being remade — and prices continue to drop. *Pages 89 and 115*

As IBM forms a new division to tackle the information highway and other newer technologies, some of these **leading-edge toys are not setting the world on fire.** Multimedia, workflow applications and videoconferencing, for example, are getting a ho-hum response. *Pages 8, 69, 72 and 85*

On the other hand, the **Internet** continues to take off, despite security concerns and a lack of friendly tools. *Pages 39, 84 and 148*

Xerox and USAir are remaking their IS departments to form closer ties to their business end users. *Page 12*

Windows software is having problems: Users have threatened Borland with defection unless it ships its dBase for Windows soon, and Microsoft says it will strip features out of its next version of Windows NT before it will let the shipment date slip again. *Pages 6 and 12*

Meanwhile, **IBM will put its Taligent application frameworks into OS/2** to give those developers an edge over users of Windows development tools. *Page 4*

The U.S. Department of Justice gives the green light to the year-old plan for BT to purchase a 20% stake in MCI for $4.3 billion. At the same time, IBM is getting ready to announce ATM and APPN wares. *Pages 1, 10 and 14*

Notes about Notes: IBM is developing gateways tying Lotus' Notes workgroup software to the Distributed Computing Environment for a small number of customers. And David Coursey reflects on the high- and low-water marks of Notes. *Pages 16 and 76*

What's the worst IS job? According to a *Computerworld* poll, **help desk** positions are the pits. *Page 139*

Object reorientation: NextStep is finally getting some respect; Gupta makes announcements; tools to develop distributed applications ship; and corporate IS shops are figuring out what it takes to make all this stuff work. *Pages 1, 28 and 101*

The 5th Wave *by* Rich Tennant

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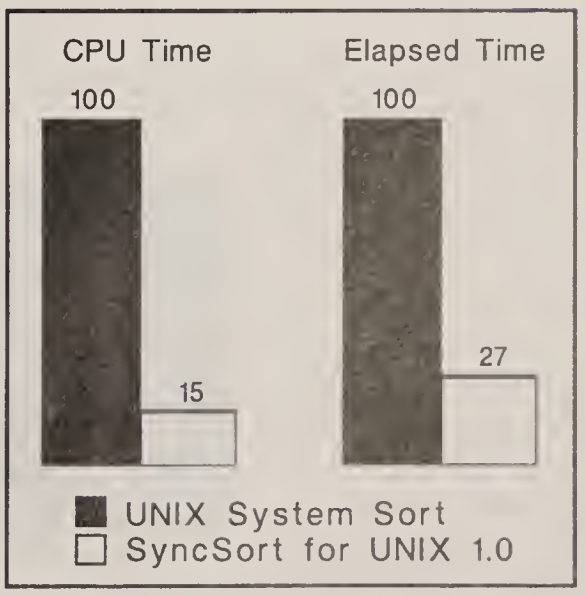

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IBM bumps up schedule to put Taligent features into OS/2

By Ed Scannell

Looking for every advantage it can gain against Microsoft Corp.'s Windows juggernaut, IBM is accelerating its plan to incorporate a number of higher-level capabilities from Taligent, Inc. into OS/2.

Many of those features, which include three-dimensional graphics, advanced multimedia and the ability to manipulate compound documents, will be incorporated into multiple versions of OS/2, including the successor to OS/2 2.1.

But the desire to squeeze features of Taligent and OpenDoc, the compound document architecture from Component Integration Laboratories, into OS/2 will push back deliveries into the first or second quarter of 1995, sources close to IBM said recently. IBM's goal was to ship the follow-up to OS/2 2.1 by year's end.

IBM is also formulating a branding strategy under which it will promote a version of OS/2 2.x as being "Taligent-aware or -capable," giving IBM a chance to capitalize on a sexier brand name and transition away from the OS/2 moniker.

"There is definitely going to be this notion of brand awareness with the 'Taligent brand.' It is high time they started thinking about this," one developer said.

The Taligent features that IBM wants to get into OS/2 are contained in Taligent's recently released beta version, which contains 80 object-oriented frameworks. These constitute close to 80% of the Taligent Application Environment (TAE) released to developers last week. Developers can use the frameworks to create Taligent applications before the operating system is released.

Company officials recently showed the TAE running a version of Microsoft's Windows NT. They also showed OS/2 and Hewlett-Packard Co.'s HP/UX using one of the Taligent frameworks. The frameworks are intended to allow applications to run and share resources across multiple platforms with minimal tailoring to specific environments. For example, one Taligent framework will provide operating system-based SQL database access for all applications.

No contest for Windows

While sales of OS/2, particularly those of OS/2 for Windows, remain steady, the product continues to be outsold at a 10-to-1 clip by Windows, most analysts agree. With few applications written specifically to take full advantage of OS/2 and no exclusive bundling deals with OEMs, most OS/2 developers were enthusiastic about IBM's decision. They said they believe it will give them a technical and marketing advantage over Windows-based application vendors.

"Taligent [technology] appears central to whatever IBM does over the next few years, which is why we are throwing our hat in this ring. It's a more comfortable place to be than most others for us these days," one OS/2 developer said.

At a Taligent developer's conference earlier this month, most developers said they were impressed with the progress IBM has made on the operating system, especially in the area of portability.

IBM is promoting a version of OS/2 2.x as being 'Taligent-aware,' giving IBM a chance to capitalize on a sexier brand name.

"They have filled in some gaps that I thought would still be there. The portability has come along nicely because the range of platforms it was running on was impressive," one OS/2 developer said.

"I don't think there has ever been any doubt that this was what IBM wanted to do, although there has been a lot of controversy among industry observers about such a move," said Brent Williams, a software analyst at International Data Corp. in Framingham, Mass.

While IBM officials declined to comment on plans to incorporate Taligent features into future versions of OS/2, they did say they plan to release software development kits in the next three or four months for Taligent and OpenDoc.

"We are thinking of branding strategies for all operating systems, period," said John Soyring, director of software development support at IBM's Personal Software Products. "We have found targeting different operating systems at different market segments to be valuable."

One framework missing that most developers expected to be ready was the data access framework, which allows access to a wide range of SQL databases through the TAE. But while developers cannot access database information through the TAE, they can do so for now through the AIX operating system.

Besides demonstrating the latest cut of its "People, Places and Things" interface, the company showed off the operating system's workgroup capabilities called "People in Places." These allow users to share information seamlessly across a range of software environments. Most of these capabilities will not be available until the follow-up release of the operating system late next year, developers said.

Taligent released two CD-ROMs to developers last week, one containing the operating system's code and the other containing its documentation.

"They have come a long way with the documentation, which means they are now more comfortable about all this stuff working," one developer said.

Gupta announces tools and database upgrades. See page 101.

Digital readies next reorganization phase

By Mary Brandel

Speculation, rumor and innuendo have spread like wildfire in the six weeks since Digital Equipment Corp. Chief Executive Office Robert Palmer issued his now-famous promise to sell or spin off assets at the beleaguered company.

Digital has responded to the rumors by becoming more tight-lipped than usual. But the code of silence was momentarily broken last week, when Digital made public a letter Palmer sent to senior managers following a meeting of the board of directors.

CEO Robert Palmer *declined to provide plan details*

Although he revealed no specifics of the plan, Palmer said the board had accepted and supported "specific steps we plan to take" and "tough initial decisions we have already made" to return to profitability.

The board's actions are expected to be announced before Digital publicizes its year-end results, slated for July 26.

Insiders said last week that Enrico Pesatori, vice president of worldwide sales and marketing, was expected to propose a restructuring of the Systems Business Unit, which he directs.

The unit now includes Alpha AXP and VAX systems and servers, operating systems, board upgrades and all layered software, including networking software, application development tools and databases.

Senior management was also expected to propose creating five autonomous business units, each with its own sales force and profit-and-loss responsibility, said a source close to the company. A realignment would enable Digital to accurately count revenue streams and determine which businesses are profitable.

Such a move "would help them make intelligent decisions about what they want to sell and what a fair price would be," said Frank Romano, an analyst at Aberdeen Group in Boston. "They'd have to provide any prospective buyer with an accurate account of expenses and revenues," which Digital currently cannot do, he noted.

Coming announcements

Analysts and sources close to Digital said the company is likely to announce the following in the next month:

- Yet another statement of direction aimed at specifying Digital's core competencies.
- More layoffs, in keeping with the 20,000 announced in May. The layoffs would most likely occur in administration, sales/marketing, professional services and maintenance groups, analysts said.
- Autonomy for certain businesses such as storage, PCs and professional services.
- Asset sales, particularly in layered software. Digital's Rdb relational database is widely believed to be a prime target.

But while observers are certain Digital is talking with other companies concerning asset sales — and that Digital will likely shed some businesses — some doubted that the near-term pronouncement will live up to the wild speculation preceding it.

"Some work remains to be done, so it is premature to discuss our detailed plans and subsequent actions," Palmer wrote to his senior managers. But "a brand-new Digital will emerge from these efforts," he noted.

When Digital is finally ready to speak, the sizzle will count as much as the steak. "If they botch this one," said Terry Shannon, an analyst at Illuminata in Hollis, N.H., "Digital loses its last best chance to make a comeback."

Corrections

Due to a reporting error, an article on Oracle Corp.'s Version 7.1 database [CW, June 13] incorrectly stated when the product would be announced. Oracle 7.1 is scheduled for unveiling on June 22.

In the May 9 Guide to Mobile Computing, Xylogics' remote access server pictured on page 97 should have been labeled the Annex Three. Also, the Annex Three will not "disappear." Although its remote access technology will be integrated into hubs from Cabletron Systems, Inc. and SynOptics Communications, Inc., company officials said the product will still be available as a stand-alone unit from Xylogics' resellers.

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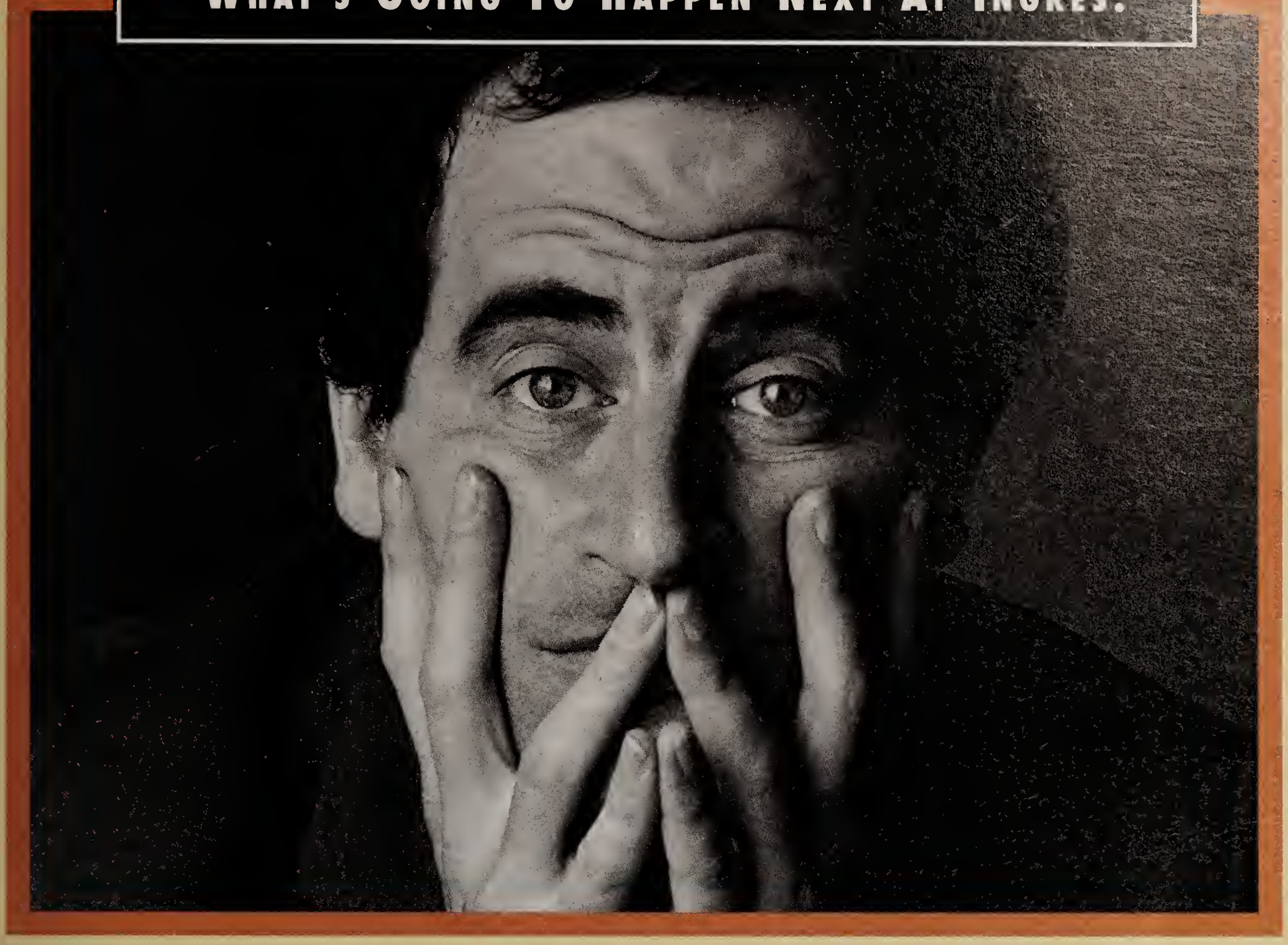

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ORACLE

Software development: A glimpse ahead

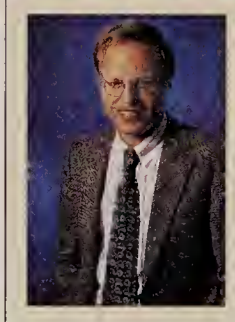
There were 143 entrants, 24 finalists and eight winners in the Windows World Open contest this year, and each winner received instant recognition in the form of an award from Bill Gates and publicity in *Computerworld*. Now I would like to take a moment to describe one of the losers.

TeamMate from Price Waterhouse was one of 24 finalists but didn't make it to the winner's circle. Nevertheless, this impressive Windows application gives us a glimpse of how in-house teams will develop software in the future.

Price Waterhouse built this application for audit teams using five C++ developers over a two-year period. Its $1.8 million investment exceeds that of many of the winning entrants, but TeamMate is really distinguished by the way it integrates three popular off-the-shelf applications into an auditing system — Borland's Quattro Pro spreadsheet, WordPerfect's word processor and Watermark Software's imaging system.

Price Waterhouse superimposed TeamMate on the three shrink-wraps, extending them to do things for the audit process that they could not accomplish on their own.

The Meta View



Originality can be a hard quality to recognize.

Charles Babcock

An audit at a Fortune 500 company consists of a massive paper trail thousands of pages long. TeamMate implements hypertext links between a wide variety of documents, allowing an auditor to jump backward through related figures in reports or spreadsheets to the original information.

Auditors traditionally use a set of symbols that are a shorthand language for what numbers mean. With TeamMate, auditors can implant these "tick mark" symbols in the electronic documents. Clicking on a highlighted figure prompts the display of the symbol, and Price Waterhouse has even extended the set: Little golden arches, for example, means "amount considered minor for further testing."

The real accomplishment of this application, however, is the way it sits atop the off-the-shelf packages, extending them within their own formats. Normally, Quattro Pro doesn't recognize double-clicks in a spreadsheet cell, but double-clicks were needed to activate the hypertext feature. So Price Waterhouse developers wrote a monitor in TeamMate to intercept the clicks and make a call to a Dynamic Link Library. A macro activates a chain of events that lets TeamMate identify the figures in the cell, consult a database of references and find and display the original document, explains Sheldon Laube, national director of information and technology at Price Waterhouse's technology center in Menlo Park, Calif.

In this way TeamMate gets WordPerfect and Quattro Pro to do what is so difficult in the real world of paper-based audits: tie together related figures but allow each to be viewed in context.

TeamMate extends the underlying applications in other ways. The Quattro Pro icon bar has been given a "publish a cell" icon (a link of chain) and a "review annotations" icon (a check mark with glasses). By clicking on the latter, an auditor can get a directory of all the review notes associated with a document.

TeamMate imposes its own file-locking system on the underlying applications, ignoring their varied locking mechanisms and allowing a group of auditors/reviewers to work with the same document set.

TeamMate is a new kind of application, organized around different principles than all the other entrants in the Windows World Open. It is an original, superset application that customizes shrink-wraps to serve a complex business process.

TeamMate didn't win the contest, but its authors should remember that originality can be a hard quality to recognize. They didn't get their pictures flashed on a screen at an awards ceremony or shake Bill Gates' hand. But they shouldn't be surprised someday to see a lot of developers trying to duplicate what they have done.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Pressure builds for Borland to ship dBase for Windows

By William Brandel

After four years of promising that dBase for Windows would be out "soon," Borland International, Inc. will finally unveil its long-awaited and much-touted product at PC Expo next week in New York. As might be expected, Borland officials conceded that the product will not ship when it is announced but will be out "soon."

Just how soon is critical for Borland, users and analysts agreed.

The vendor must also take care to ship a clean product, given the buggy history of some of Ashton-Tate Corp.'s dBase deliverics. Ironically, Ashton-Tate's demise from a once-thriving industry leader to a financial shadow of itself has been attributed largely to a late and unstable delivery of dBase IV.

Last week, Borland briefed Wall Street analysts and once again demonstrated dBase for Windows — almost three years to the date when they first saw the product demonstrated in 1991. For Wall Street, a timely delivery of dBase for Windows could mean Borland is getting on track for its promised return to prosperity.

Pressure cooker

While Borland hustles to get dBase for Windows out the door, competitive pressure is mounting from Microsoft Corp.

Microsoft has targeted dBase users with its FoxPro 2.6 database, which is considered to be 95% to 99% compatible with dBase. FoxPro has 473,000 users worldwide, according to Nicole Roth, an analyst at International Data Corp., a Framingham, Mass., research company. But that user base has expanded at a 500% growth rate since Microsoft aequired Fox Software, Inc. in 1992.

After extending a $99 introductory rollout of FoxPro 2.6, Microsoft will offer a "convert your dBase files or your money back" guarantee for the product. Conversely, Borland will offer its Windows product as a $199 upgrade to the dBase population, Borland officials said.

Analysts said Borland will not offer a competitive upgrade to woo customers who have purchased databases from its rivals. "They think it's good enough that they don't have to do that," said Michael Wallace, a securities analyst at UBS Securities in New York.

Borland is expected to successfully upgrade 10% of its 6.7 million users to dBase for Windows during the first six months after the product ships, Roth said.

The tool stands out as the last major desktop application to provide true compatibility with Windows, which now runs on nearly half of all desktops in corporations worldwide. Its nearest, and some say only competitor, FoxPro, has been up on Windows since1993.

According to beta users, dBase for Windows is a major upgrade from dBase for DOS. In addition to being fully integrated with the Windows graphical environment, it is supposed to include new programming features such as two-way tool capabilities. This tool will enable users to manipulate code visually in one window and then view the procedural output of the code in a separate window.

"That two-way feature is pretty neat," said Henry Silberman, chairman of the NYPC Xbase user group based in Brooklyn, N.Y. "It has driven me over the top."

How soon this product will actually ship is still up in the air. Borland's public relations department maintains that the company is still targeting a summer delivery. That timetable was confirmed by David Watkins, Borland's vice president and general manager of its database business unit.

Watkins said bug fixes and further stabilizing will be done early next month. Borland is currently receiving bug reports at a rate of 100 per day, he said. He could not quantify what percentage of the bugs were cosmetic as opposed to major bugs. The product crashed during a demonstration at the company's developer's conference in Orlando, Fla., earlier this month.

"It looks like July is likely" for delivery, Watkins said. However, Wall Street analysts and industry sources said that late August to early September were more likely ship dates.

Lotus, WordPerfect chase after Microsoft with suite offerings at PC Expo. Page 39.

User ultimatum

Message to Borland: Ship dBase for Windows soon or expect to lose all but your most faithful users.

Calls placed to a half dozen dBase user groups indicate fracturing among the dBase population due in large part to Borland's and Ashton-Tate's botches in delivering stable dBase products on a timely basis. For them, dBase for Windows represents another in a long line of disappointments to emerge from the dBase product line.

"About a quarter to a third of our group, including some dBase diehards, have already been swayed to FoxPro," said French Morgan, chairman of the Central Coast dBase User Group based in San Luis Obispo, Calif. "They wanted to get into a Windows development environment and just got tired and frustrated from waiting."

Another user group is also experiencing a FoxPro migration, but for different reasons. "A lot of us invested in Borland stock," said Bill Sumerford, spokesman for the Society of Petroleum Engineers Microcomputer User Group based in Dallas. "From a longevity standpoint, would you want to ride a horse on a long trip that may not be there tomorrow?"

However, there remains a stubbornly loyal segment within the Borland developer community who says they will wait as long as it takes to get dBase for Windows.

"It's got all the ingredients," said Ron Jones, spokesman for the dBase user group in Tempe, Ariz. "I'd say the majority of us will upgrade. But it's got to get out, and it's got to be right."

— William Brandel

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Microsoft plans SQL Server for Cairo

A Cairo-enabled version of SQL Server is set to arrive in concert with Cairo, which is due at the end of 1995, Microsoft officials said last week. That version, which will come out after SQL Server '95 [CW, June 13], will take advantage of Cairo's Object File System to provide support for many advanced functions. These include support for distributed joins, hicrarchical data types, data versioning and row locking, extended user-defined functions and conformance with the ANSI-92 SQL standard, the company said.

3Com posts year-end loss, Q4 profits

3Com Corp. in Santa Clara, Calif., announced record results for its fourth fiscal quarter, which ended May 31. The company reported a profit of $27.2 million on sales of $241.5 million, an increase of 105% and 44%, respectively, compared with the same period last year. For its fiscal year, 3Com posted a loss of $28.7 million on revenue of $827 million, which it attributed to costs associated with three acquisitions. For fiscal 1993, the company earned $38.6 million on revenue of $617.2 million. Separately, Standard Microsystems Corp. in Hauppauge, N.Y., reported record earnings for its first fiscal quarter. Profits increased 33% to $5.4 million, and net sales were up 17% to $80 million compared with the same period last year.

Sharp combines RAM and ROM on chip

Sharp Electronics Corp. in Mahwah, N.J., has developed a new memory device that combines RAM and ROM on a single chip. The chip allows handheld and portable systems designers to program fixed data into ROM of arbitrary size in the RAM area. The feature allows RAM and ROM to be accessed at the same speed while also eliminating unused surplus memory and board space.

BellSouth switches net underpinnings

BellSouth Corp. said last week it will move its cellular network to Time Division Multiple Access (TDMA) digital technology in the next two years. TDMA divides cellular channels into parts, increasing the number of calls they can carry by as much as three times. The company will spend $100 million deploying the technology across its 15-state network.

Unisys expects lower earnings

Unisys Corp. said it expects lower second-quarter earnings because of continued weakness in its European business. Unisys Chairman and Chief Executive Officer James A. Unruh said earnings per share in the second quarter, which ends June 30, will likely be less than the 17 cents per share reported in this year's first quarter. The company still expects a profitable second quarter, including a year-to-year quarterly increase in worldwide commercial orders.

Striking open systems

Hewlett-Packard Co. and **CAP Gemini America, Inc.** last week announced a service to help oil and gas companies migrate legacy applications to Petrochemical Open Software Corp. (POSC) standards. It will combine CAP Gemini's business process modeling and project management services with Compass, HP's implementation of the POSC specification.

SHORT TAKES James Mazzarella was named director of MIS at **Lintas Worldwide**, a New York advertising agency. He was formerly assistant vice president at Skandia International. . . . **Apple Computer, Inc.** last week said 100 native software applications are now shipping for its Power Macintosh.

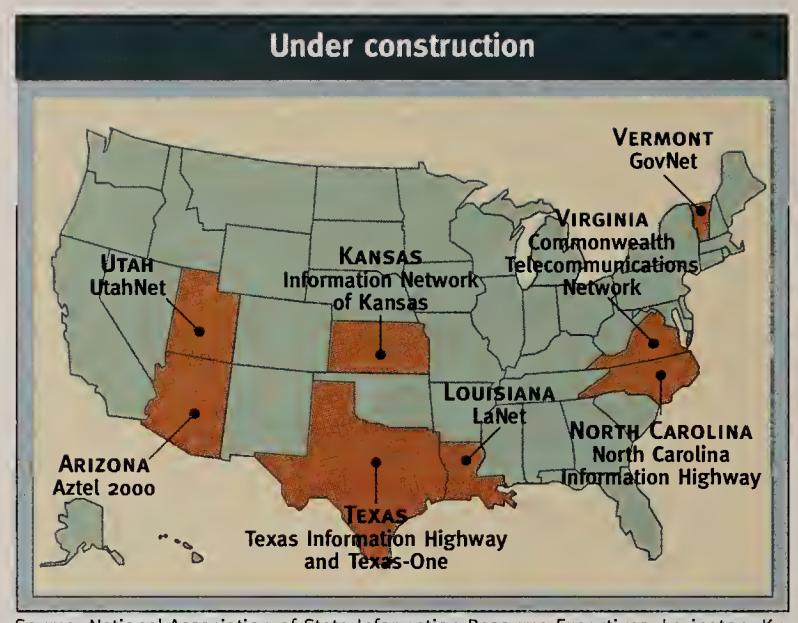
States bypassing Feds on information highway

By Mitch Betts

While the federal government slogs along mapping out an interstate data highway, state governments are racing by. North Carolina, Utah, Texas and others are already building ambitious state highways that link state and local agencies, schools, businesses and the general public.

Other states building information highways include Virginia, Vermont and Louisiana (see map). These so-called highways typically have a high-bandwidth backbone network or Internet access, or a blend of the two.

Perhaps the most ambitious state is North Carolina, which this month began building a $160 million statewide fiber-optic highway based on Asynchronous Transfer Mode (ATM) and Synchronous Optical Network (Sonet) technology with BellSouth Telecommunications, Inc. At 116,000 fiber miles, it is reportedly the most extensive ATM/Sonet network in the world.



Source: National Association of State Information Resource Executives, Lexington, Ky.

Top of the agenda

The top applications planned for the North Carolina Information Highway include "distance learning," telemedicine and economic development, said Rachel Eagles, the project manager in Raleigh, N.C. For example, digital maps of site locations can be sent to businesses considering moves to the state, and an in-state firm such as Freightliner Corp. can have employee training courses beamed in from a remote community college, Eagles said.

"The states are saying, 'We just can't wait,' " said Wayne McDilda, system architect for the Texas Information Highway, based in Austin. Texas has taken an unusual, low-cost approach of putting an electronic repository of information, such as job listings and environmental maps, on the Internet and a dial-up computer bulletin board.

In addition to providing statewide electronic mail and bulletin boards, states expect that building a single backbone will achieve economies of scale and sidestep the redundancies that occur when individual agencies build their own networks.

Act quickly

In North Carolina, the first 106 network sites will be on-line in August.

"The reason we're moving so fast is that we have a window of opportunity with strong leadership from the governor's office. We might not get a governor who supports technology [investments] the next time around," Eagles said.

Meanwhile, Utah is half-finished with its statewide frame-relay network, called UtahNet.

Leon Miller, the state's director of information technology services in Salt Lake City, said ATM was not mature enough when Utah got started, but the state's goal is to migrate from frame relay to ATM in about two years.

UtahNet — which supplier US West claims will be the biggest frame-relay network in the world — recently won an award for wide-area network innovation from the National Association of Information Resource Executives in Lexington, Ky.

The network already supports 7,000 computing devices in state agencies and is adding about 400 a week, Miller noted. It supports a public-access bulletin board for citizen and business information and eventually will reach schools and local government.

Staff flight a worry

Both Miller and McDilda said their biggest problem is that their key networking staffers are lured away by high-paying vendors once they learn the advanced networking technologies.

State information systems managers say their biggest problem is retaining their networking staffers once they have learned the advanced technologies.

"We've lost some key people to outside companies that can pay a lot more than state government can," Miller said.

IBM launches 'highway' unit

Hoping to play a bigger role in the so-called "information superhighway," IBM recently formed a Networked Application Services Division to build multimedia communications applications for business and home markets.

Fernand B. Sarrat is the new general manager of the division. He will report to IBM Senior Vice President James A. Cannavino. The division will build applications to run on Advantis, IBM networks worldwide and the struggling Prodigy service.

Fernand B. Sarrat *will head the application services division*

Areas falling under Sarrat's purview will be the following: interactive TV, multimedia systems, personal communications services, collaborative computing, electronic publishing, public kiosks, electronic commerce and Internet-related business.

—Mitch Betts

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AT&T

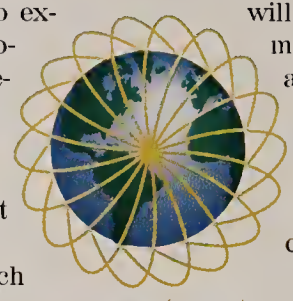
BT, MCI team to offer one-stop global telecom

By Ellis Booker
CHICAGO

The U.S. Department of Justice gave the green light last week to the year-old plan for BT to purchase a 20% stake in MCI Communications Corp. for $4.3 billion. The move launched the two partners into a joint venture to deliver "one-stop shopping" to multinational companies seeking global communications services.

Called Concert, the new company plans to create a network linking more than 5,000 access points in 55 countries by spring 1995. In addition, the venture will define standards for interoperability, network management, provisioning, customer support and billing.

"Customers will be able to expect the same knowledge, procedures and support levels regardless of their location," said Kathleen R. Flaherty, senior vice president of worldwide sales and marketing at Concert.



Analysts said Concert, which will include a centralized network management center in Atlanta and a staff of 700 to 1,000, will do a better job of simplifying international communications than the spate of "marketing alliances" between carriers in the past.

"All the carriers rolled out 'one-stop shopping' [alliances], and they were all dismal failures," said Ken McGee, a vice president at Gartner Group, Inc. in Stamford, Conn.

McGee added that the business opportunity for making international communications simpler is enormous. "The realities of international communications just make your hair hurt," he said.

BT and MCI said they intend to invest $1 billion in Concert in the next five years.

Global centers

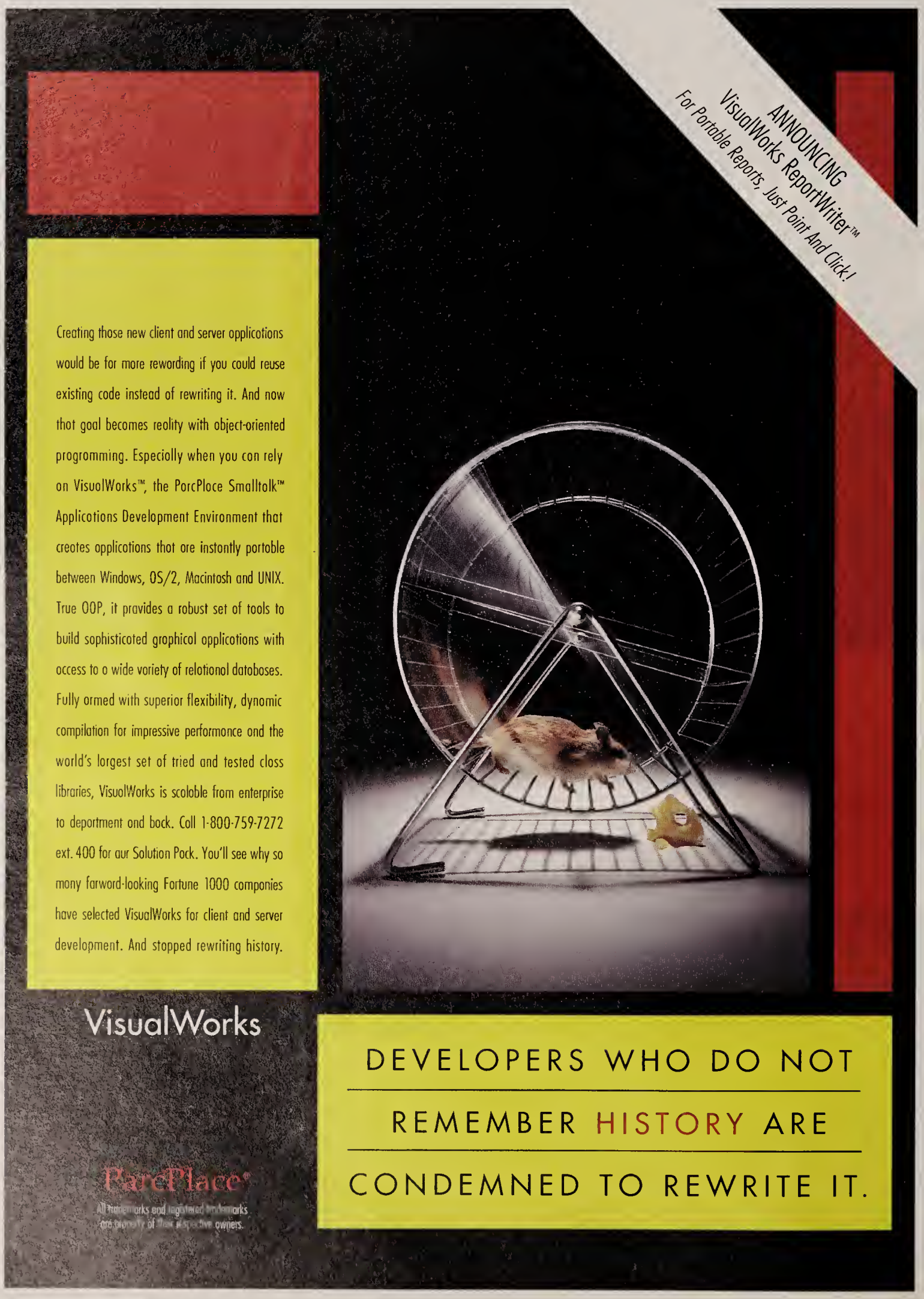
Concert will include Global Customer Support Centers in London; Paris; Sydney, Australia; Tokyo; and Cary, N.C. Each of the centers will offer multicurrency billing support and seven-day, 24-hour multilingual customer support.

MCI and BT will act as distributors for Concert products and services, with MCI handling the domestic market and BT handling the international scene. They did not detail how Concert-based services would compare in price with services from other carriers, however.

"We expect the economies of scale that derived from an integrated, heavily loaded network will...drive price advantages," Flaherty said.

On the other hand, the opportunities for pure network outsourcing could be significant.

The alliance has been approved by UK and European regulators, and MCI shareholders passed the plan in March.



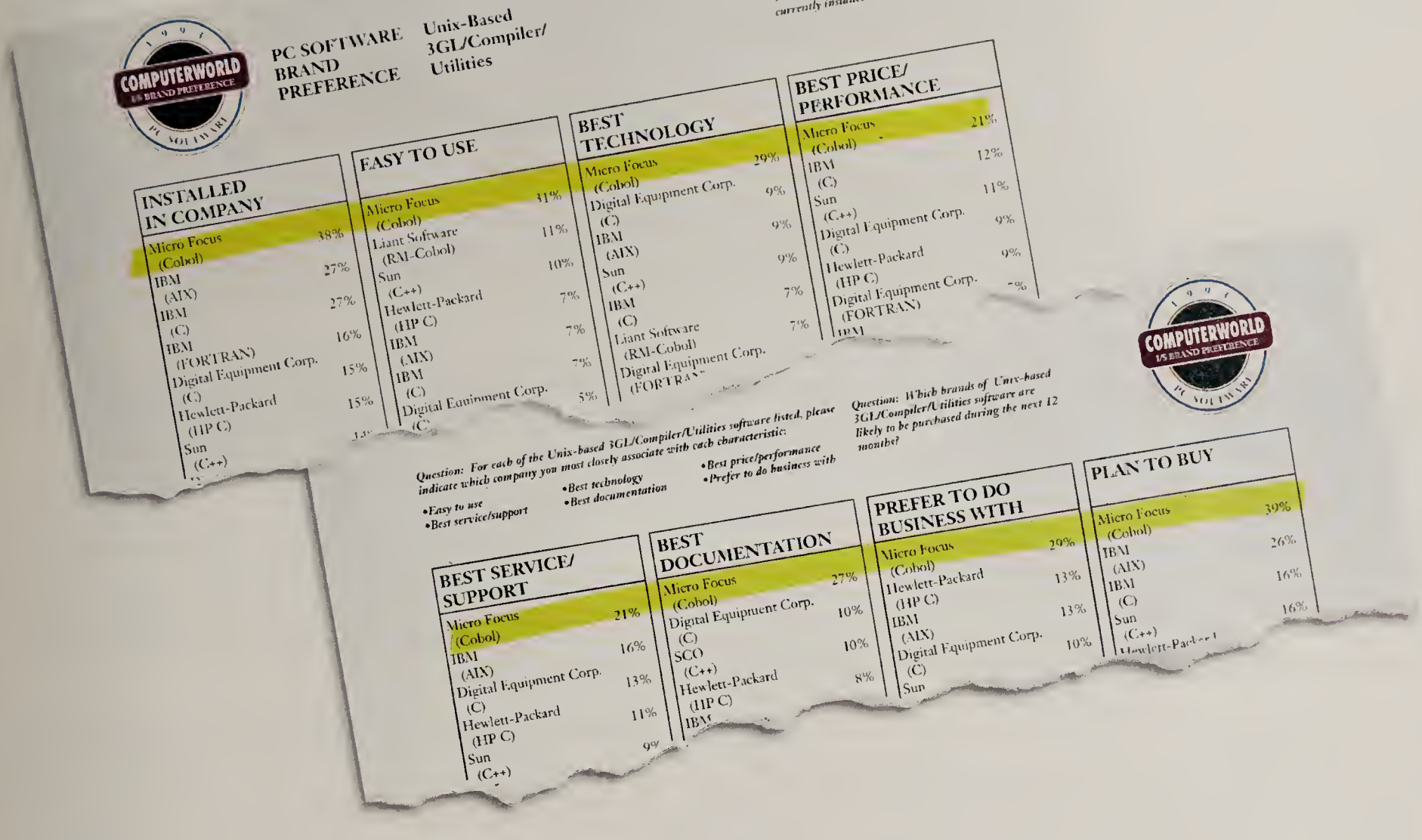
Deal miffs AT&T

Sprint Corp. last week disclosed plans to sell a 20% stake for $4.2 billion to the French and German national carriers.

The plan, which must be approved by regulators in the various countries, calls for a global network that is owned, planned and managed by the three partners. Sprint will own 50% of the alliance's backbone network, while Deutsche Telecom and France Telecom will split the other half.

AT&T Corp. officials last week fired off an objection to the plan, arguing that the French and German telecommunications markets are closed to U.S. carriers.

Approval of the plan would allow the three companies to leverage an estimated $155 billion in assets and more than $70 billion in revenue. —*Ellis Booker*



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Microsoft Mail goes client/server

By Lynda Radosevich

When Microsoft Corp. this week finally unveils its long-awaited client/server messaging line, the rearchitected update to Microsoft Mail will address the scalability and administration problems of PC LAN electronic mail.

Also featured in the newly named Exchange line will be groupware functionality along the lines of Notes.

Information in documents obtained by *Computerworld* and confirmed last week by Microsoft officials showed how the Exchange line speaks to administration needs with features such as a centralized, graphical view of all Microsoft system components. The line includes a tightly integrated server, client, group scheduler and combination forms/application design tools.

"Microsoft's client/server messaging really interests us and fits in with our plans of where computing is going," said Pharid Jaffer, director of information systems at George Weston Ltd. in Toronto.

Taking care of basics

The Exchange server, formerly called Enterprise Messaging Server, addresses key scalability and security issues facing firms that are downsizing messaging off mainframe platforms. It runs exclusively on Microsoft's upcoming Windows NT 3.5 (Daytona) and uses Daytona to support disk mirroring and symmetrical multiprocessing.

In support of this capability, Sequent Computer Systems, Inc. in Beaverton, Ore., this week will announce plans to deliver Exchange on Sequent's high-end WinServer line. Also, Sequent will offer messaging consulting and integration services, including but not limited to Exchange, according to company officials.

Another piece of the Exchange server will be tools that enable users of IBM's Professional Office System and Digital Equipment Corp.'s All-In-1 E-mail to import into the server the mailboxes, user accounts and distribution lists from any directory that supports delimited text files, the Microsoft documents said.

David Ferris, president of Ferris Networks in San Francisco, said he is impressed with administration capabilities such as setting an alert to go off if a message takes more than 40 minutes to arrive at its destination. "That's very unusual, and it's one of the basic mail management requirements."

Other Exchange details include a server-based forms registry that lets administrators post electronic forms in a central repository and lets users access the forms via a pull-down menu in Exchange.

The repository will manage master forms such as travel reimbursement and replicate changed masters to other Exchange servers. In addition, third-party products such as those from Delrina Corp. and JetForm Corp. will be able to use the forms registry. Delrina and JetForm plan to announce their forms support this week.

Originally targeted for the first half of this year, Exchange is now scheduled to ship early next year. Microsoft has not yet announced pricing or exact ship dates.

Flip side

On the downside, competitors and industry analysts pointed out several weaknesses in Microsoft's Exchange:

- It operates only on Windows NT, whereas messaging/groupware servers from Lotus or WordPerfect operate on several platforms.
- Both Daytona and the Exchange Server are new systems, which could compound problems with unexpected bugs.
- Some advantages Microsoft is offering already exist in competitors' products.

Users more focused on Daytona ship

By Stuart J. Johnston

Microsoft Corp. officials last week repeated their commitment to ship a major update of Windows NT next year and said they would strip out features before they let Cairo's timetable slip again.

But users said they could care less about that version. Instead, they are focused on the next version of NT, code-named Daytona and due out this summer. Daytona is reportedly faster and smaller than the current NT and features more network independence. Cairo will add an object-oriented file system and the user interface set to debut in Windows 4.0, the major update of desktop Windows due late this year or early next year.

"We're deploying the 'here and now,'" said Dan Willis, lead analyst at 3M Co.'s LAN services group in St. Paul, Minn. "We'll be interested in [Cairo] in another year."

Dan Foley, senior network analyst at the University of Texas in San Antonio, was more concerned, saying he hopes Microsoft will not strip anything out of Cairo. But he, too, is focused on the near term, including Daytona. Higher on his priority list is the pending release of Microsoft's Systems Management Server, or Hermes.

No slips this time

Last week, Microsoft officials said if it comes down to cutting Cairo features or being late, they will likely use the knife. However, they cautioned that Cairo's ship date is far enough away that they have no idea what might be left out.

"The truth is, it will all go on the table, but I'd be surprised if any [major features] came out," said Rich Tong, general manager of marketing at Microsoft's Business Systems Division.

Hermes lets systems administrators perform software updates and hardware/software inventories on the network. "Right now, the only thing NT lacks is their [systems] management. That's a big deal for me," Foley said.

Xerox splits IS duties with EDS

By Mark Halper

The 10-year, $3.2 billion outsourcing contract recently signed with Electronic Data Systems Corp. is just one piece of an ongoing technology and business process overhaul at Xerox Corp., Patricia Wallington, Xerox's chief information officer, said last week.

Although EDS will assume vast responsibilities to run mainframes, maintain legacy software and pay Xerox's phone bills, Xerox is not vesting the outsourcer with development of client/server applications for new functions or business process re-engineering, according to Wallington.

Instead, Xerox will keep those tasks in-house, assign them to other third parties or give EDS an opportunity to bid on them in the future. "We want to focus our internal staff on moving us to the environment that will support us tomorrow," Wallington said.

Xerox chose EDS over teams led by IBM's Integrated Systems Solutions Corp. and Computer Sciences Corp. because of its strengths in global support and employee absorption, the CIO said. She declined to quantify the "considerable savings" Xerox said it hopes to achieve.

About 1,700 Xerox information systems workers will transfer to EDS. Of those, 1,100 in the U.S., UK and Canada will make the switch by the end of this month. The remainder will move by the end of the year, Wallington said. Xerox is retaining 750 IS workers and eliminating 250 IS jobs, she said.

Xerox's Pat Wallington: *heading toward object development*

Gary Anderson, a group executive at EDS, said Xerox and EDS hope to establish new application needs and directions within six months. Xerox's development will lean heavily on a reusable, object-oriented approach, Wallington said.

The company has enlisted Andersen Consulting to guide it through part of its Information Management 2000 re-engineering program, which includes eliminating 10,000 jobs in two years. Xerox will require a wealth of client/server applications to support Information Management 2000, Wallington said.

USAir overhauls IS to cut costs

Scraps CIO post, forms technology council

By Julia King

USAir Group, Inc. is overhauling its information systems organization as part of the struggling airline's ambitious plan to slash costs $1 billion a year by 1996. Among other things, it is scrapping its chief information officer post and forming a 12-person information technology council comprising finance executives, business managers and applications development personnel.

Also on the horizon is the possibility of further cuts to its 800-person IS staff and, oddly, an increase in the airline's annual information technology budget, which now stands at about $110 million.

"Traditionally, we have underspent [on information technology] in comparison to other major full-service carriers," said John Harper, senior vice president of finance and the information technology council chairman. Now "it's a priority to increase the IS budget if we're able to get the labor concessions." As part of the overall cost cuts, USAir has asked its unions for about $500 million in annual wage and benefits reductions.

USAir already cut 3,000 positions earlier this year.

Harper, who has also served as USAir's CIO, counts the airline's 1988 merger with Piedmont Airlines as a major factor in the carrier's come-from-behind IS position. For the past six years, USAir "has suffered from the need to integrate systems from two major airlines," a project requiring "500 man-years of development," he said.

"We have one of everything, and we're still putting together the last pieces, so we're a little bit behind [other carriers]," he noted. "But now we have an opportunity to catch up with the wise application of technology."

"USAir has been very slow to adapt to a fiercely, brutally competitive airline industry," said Chris Fotos, a director at Avmark, Inc., an aviation consultancy in Arlington, Va. "They are going to have to make information systems work harder for them, but it's a small piece of the pie. Their problems are much bigger."

Looking ahead, Harper said he expects IS to play a critical role in two areas the company has targeted for more than $100 million in savings: inventory management and maintenance.

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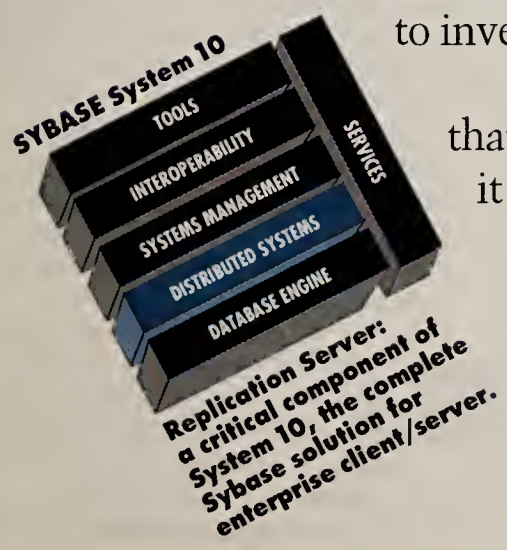

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IBM rollout targets APPN gaps

By Elisabeth Horwitt and Suruchi Mohan

IBM is expected this week to begin a major initiative that will fill in the missing links of Advanced Peer-to-Peer Networking (APPN) — the internetworking architecture the company hopes will dissuade SNA users from defecting to TCP/IP.

With the expected release of VTAM Version 4.2, users will finally be able to interconnect their legacy 3270 terminal-to-host applications over a multinode APPN network. This is the key feature major IBM shops have been waiting for to begin serious migration to APPN, said David Passmore, president of Decisys, Inc., a Herndon, Va., consultancy.

Several users also expressed eagerness to get their hands on the next version of APPN, called High Performance Routing (HPR), which is now slated for a third-quarter release, a source close to IBM indicated.

Wellfleet Communications, Inc., Cisco Systems, Inc. and 3Com Corp. have committed to implementing HPR next year.

The major HPR pluses are dynamic rerouting around failures and efficient router throughput — two features that TCP/IP now has but current APPN lacks, said Carlos Santiago, manager of telecommunications design at Pitney Bowes, Inc. At the same time, HPR provides standard APPN features that TCP/IP lacks such as class prioritization, load balancing and backup across router nodes, he added.

Dual-pronged strategy

Another user, a large paper and wood products company, is eagerly waiting for IBM to ship HPR as well as full mainframe 3270 application support for APPN, said an information systems manager at the company, who asked not to be identified. Currently an APPN user, the firm is actually "going down two paths" — the other being multiprotocol routers — for its internetworking strategy.

The question is, given TCP/IP's current prevalence, "will anyone throw it out for something only slightly better?" said Louise Herndon Wells, a director at the Internetwork Technology Institute, a Milpitas, Calif., consultancy.

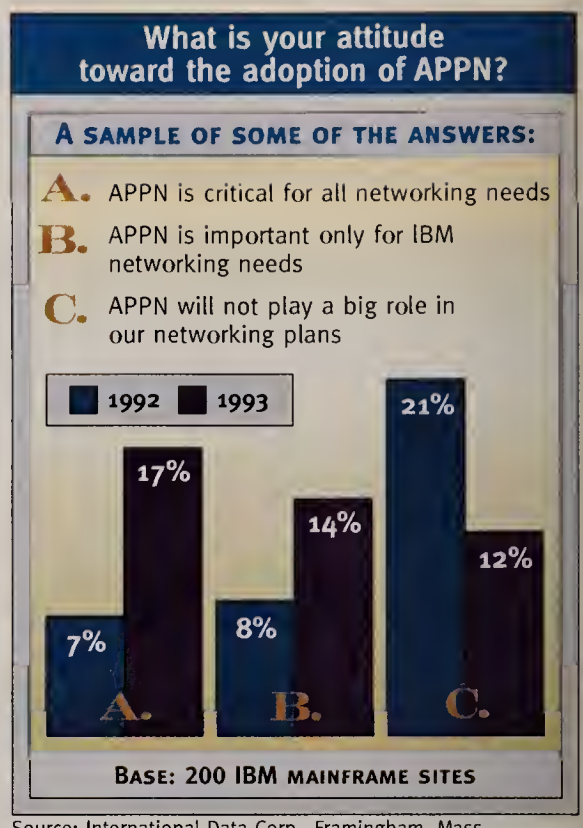
Still, IBM plans to woo TCP/IP users by providing HPR support for TCP/IP and possibly other transport protocols, said analysts and the source close to IBM. HPR will enable both TCP/IP and APPN transmissions to make fuller use of multimegabit/sec. bandwidth on frame relay and Asynchronous Transfer Mode (ATM) networks, analysts said.

This will be done by stripping off the acknowledgment and other reliability mechanisms embedded in TCP/IP, APPN and other older transport protocols, said Don McGinley, senior APPN product manager at Wellfleet. Such features were necessary on the old glitch-prone analog links.

In addition, IBM's AnyNet middleware offering (see story below), which enables applications written to TCP/IP to run over SNA and vice versa, will support HPR, probably sometime next year, an IBM spokesman said.

Nevertheless, HPR may be too little, too late to dissuade the many IBM shops that have already settled on TCP/IP as the corporatewide standard for internetworking client/server systems.

Kaiser Permanente Foundation Health Plan, for example, while still considering APPN on a site-by-site basis, is put off by the fact that the current version does not support other transport protocols such as TCP/IP, said Dewitt Hodge, manager of communications systems for the Walnut Creek, Calif., health services firm. In contrast, Kaiser's Cisco routers can encapsulate SNA traffic inside TCP/IP; plus, the increasing TCP/IP support from major client/server vendors such as Novell, Inc. and Microsoft Corp. is making it increasingly unnecessary to use any other transport, Hodge said.



Source: International Data Corp., Framingham, Mass.

AnyNet trims costs, adds NetBIOS

IBM this week plans to flesh out its AnyNet multiprotocol networking software in an attempt to take it from the conceptual stage to real-world use. Included will be the addition of NetBIOS-over-SNA support and a TCP/IP-to-SNA gateway that removes the need to install AnyNet at each TCP/IP client.

That gateway eliminates a costly requirement that also created "a lot of pain for a network manager" because of the installation time and the lack of a central point of control, said Robin Layland, principal at Layland Consulting, Inc. in West Hartford, Conn.

The AnyNet/2 Sockets over SNA Gateway resides on an OS/2 machine and costs from $600 for 20 connections to $3,000 for 250 connections, IBM said. That compares with a $199 charge for the individual client version of AnyNet/2.

Charles Hights, a senior systems analyst at Pacific Bell in San Ramon, Calif., said the gateway approach "sounds like a good strategy" for reducing the cost of AnyNet. Pacific Bell has been using AnyNet since March to transmit SNA data over TCP/IP networks, he added.

AnyNet is still in the "conceptual positioning" stage despite some early adopters, said John Morency, an analyst at Strategic Networks Consulting, Inc. in Rockland, Mass. He added that IBM has yet to fully address management issues related to the multiprotocol product.

This week's announcement will also include expanded support for running SNA data over TCP/IP transports, IBM said. AnyNet will be linked to IBM's VTAM 4.2 (expected to ship this week), which will enable it to access all types of SNA applications rather than just 3270 terminal programs.

PC servers join pricing free fall

By Jaikumar Vijayan

Recent price cuts by several major vendors seem to indicate that the focus of the ongoing price war is shifting to the PC server arena.

Led by Compaq Computer Corp. and an increasingly price-competitive IBM PC Co., server vendors have begun implementing substantial price cuts in the past few weeks. While the leap-frog price cuts between Compaq and IBM have resulted in both companies lowering their sticker prices by more than 20% on some models, other companies — such as Dell Computer Corp., Hewlett-Packard Co., Wyse Technology, Inc. and Advanced Logic Research, Inc. — have also substantially rolled back prices.

User reaction

Predictably, users are watching the falling prices with glee. "What's happening is great. It gives you more of an opportunity to expand your network," said Carrie Russell, a senior information center analyst at Hit or Miss, Inc.

The Stoughton, Mass., discount fashion retailer, which originally planned to upgrade its servers, has already taken advantage of the falling prices. It recently purchased a new and bigger server on the same budget, Russell said.

Joseph Trickey, a PC specialist at Stratton-Cheeseman Management Co. in East Lansing, Mich., is another user who is watching the nascent price war closely. He is on the threshold of buying several new systems to replace his aging 80286 and 80386 boxes and has very definite ideas about what he wants: "a good, solid, [Intel Corp.] 486-based server with at least 8M bytes of RAM, a 250M-byte hard disk [that is] capable of running Windows effectively for less than $2,500," he said. "The cost of buying a machine is critical. The total emphasis is on getting value for money."

Users like Trickey could get plenty of that during the next few years, said Lynn Berg, an analyst at Gartner Group, Inc. in Stamford, Conn. A recent study conducted by the consultancy revealed that users can expect an improvement of at least 40% in PC server price/performance every year.

Deja vu

The stage seems to be set for a full-fledged price war in the PC server industry, according to Lynn Berg of the Gartner Group. The same trends that hit the PC industry a few of years ago — increased competition, fading product differentiators and standardization of components — will affect the server market, too.

"There is going to be a lot of vendor-churn going on [as they try to] find areas to differentiate themselves from the competition," Berg said. "There are fewer and fewer areas where vendors can add value to servers." One way to do this is to cut prices, she said.

Unix pressured, too

According to Gartner Group, increased price pressures will also be felt in the RISC architecture-based segment of the server marketplace, where different versions of Unix will no longer be a differentiator.

In turn, the increased availability of standardized, off-the-shelf components from Intel and the resulting drop in integration costs will drive commoditization — especially at the low end of the server market, analysts said.

Another reason vendors are lowering the bar on server prices could be the fact that Intel CPU prices have been coming down significantly in the past few months, said Peter Kastner, vice president at Aberdeen Group in Boston.

"One-third of the price of servers is in the CPU and memory," Kastner said. So lower prices on CPUs will automatically translate into lower systems costs, he said.

ATM

CONTINUED FROM PAGE 1

nent internetworking player. Analysts said users are frustrated with IBM's habit of announcing arehiteetures long before producing affordable networking products that meet their promise.

"I would be skeptieal at this point" about buying a soup-to-nuts ATM architecture from IBM "beeause it would involve not just data but voiee and video, and I am not sure IBM has the skills for that," said Dewitt Hodge, manager of eommunieations systems at Kaiser Permanente in Walnut Creek, Calif., an Oakland, Calif.-based health serviee.

To be eredible with users and move ATM closer to the masses, IBM needs to be at least under $3,000 per end-user connection out of the gate "or this will be little more than an aeademie exereise," said Tom Nolle, president of CIMI Corp. in Voorhees, N.J. "If it does hit this price, IBM eould start a priee war that eould move ATM adoption ahead by a year or two. If not, we'll all be sitting on our hands and won't see ATM until the end of the deeade," he said. Sourees said IBM's prices would be eloser to $2,000 per port.

One of the key features of BBNS is LAN emulation: the ability to transport native internetworking and Advanced Peer-to-Peer Networking protoeols at the switch level to take advantage of ATM's high bandwidth. ATM networks support these protoeols but only at normal LAN speeds.

Money-saver

Native protoeol support will also enable IBM's ATM switehes to perform packet-to-eall eonversion rather than require peripheral network deviees such as hubs to perform this funetion. This would save users from implementing costly ATM adapters.

BBNS also provides a proprietary feature ealled Paeket Transfer Mode that supports switehing variable-length frames over ATM. Most ATM produets today switeh 53-byte cells. The eells' small size makes them more efficient in mixed-media networks beeause time-sensitive video and voiee transmissions are not delayed by longer eells eontaining data traffie.

However, this eell size is inefficient for data-only transmissions because up to 20% of ATM's bandwidth is taken up by header and administrative routing data.

For ordinary LAN-to-LAN eommunications, users ean get much higher efficiency by using longer frames, said David Passmore, president of Decisis, Ine., a Herndon, Va.-based consultancy. BBNS "offers a lot of value-added features above plain vanilla ATM," he said.

Northern Teleeom, Inc.'s Passport ATM switch is the only one to support both transport modes, Passmore said.

Earlier this year, IBM announced 100M bit/see. ATM adapter cards and chip sets that, when combined with the BBNS and switch rollout, are aimed at providing users with an end-to-end ATM network. IBM declined to provide details on unannouneed products.

AT&T's Kavner heads for Hollywood

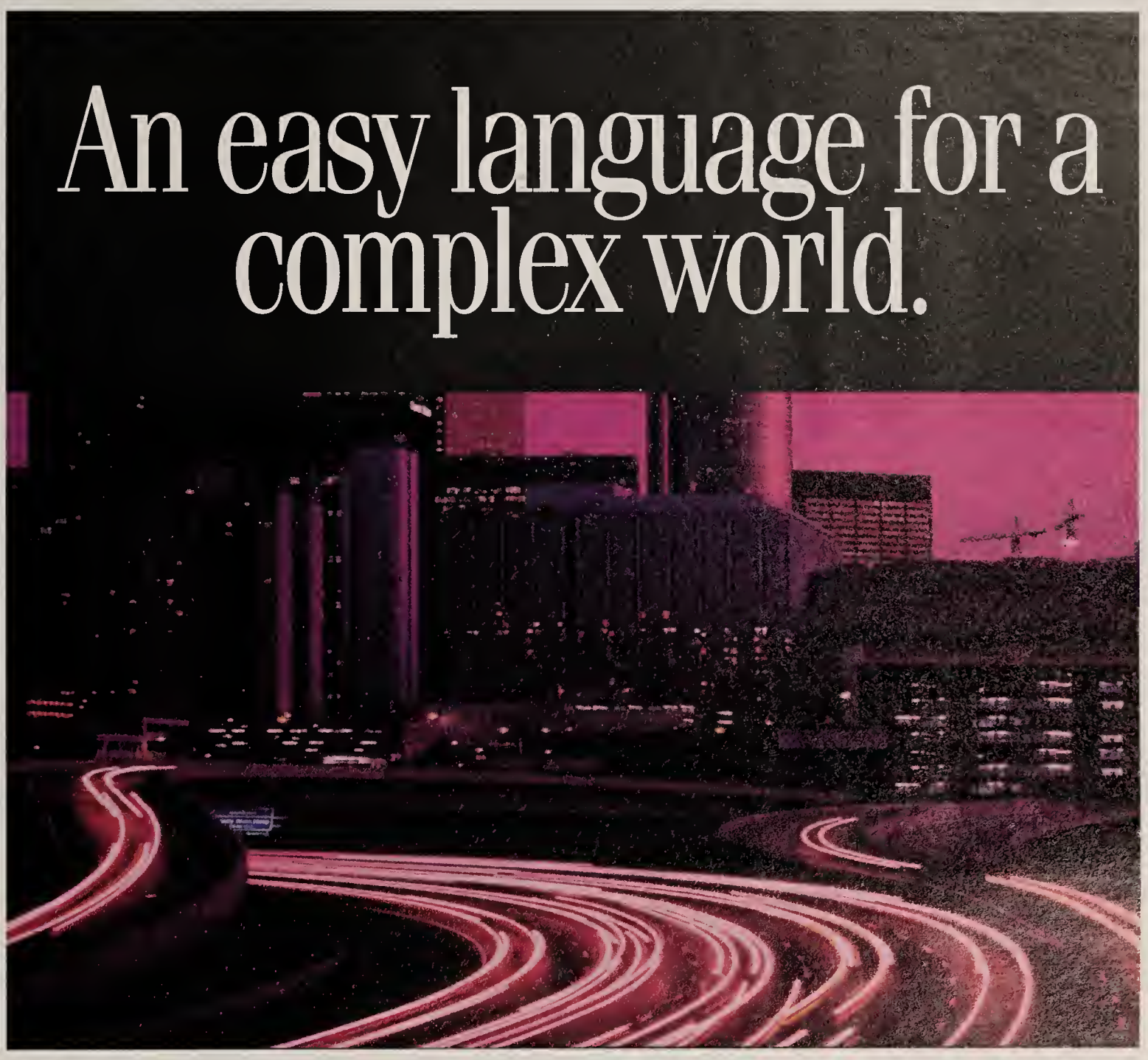
Robert Kavner, the point man for AT&T Corp.'s multimedia efforts and a fixture in its senior exeeutive ranks for a deeade, is leaving the long-distance giant to join Creative Artists Ageney, Ine., Miehael S. Ovitz's powerful literary and talent ageney in Los Angeles.

Kavner will lead in the "identification and development of opportunities for the ageney's clients in the merging digital, interactive and networked media," according to a prepared statement from Creative Artists.

One of four AT&T executive viee presidents and group ehief exeeutive officers, Kavner was appointed head of AT&T's Multimedia Produets and Services Group last August. His post will be pieked up by AT&T executive vice president and board member Vietor A. Pelson, who is chairman of AT&T's global operations team.

Before joining AT&T in 1984, Kavner was general partner at Coopers & Lybrand, where he was chairman of its information industry praetiee.

—Ellis Booker



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The Language For A Complex World

Lotus snaps up SoftSwitch

Purchase broadens enterprise communications reach

By Lynda Radosevich

Lotus Development Corp. last week said it will buy SoftSwitch, Inc., a messaging integration provider to the Fortune 1,000 companies and third parties. The move is expected to extend Lotus' mail efforts across the enterprise and give SoftSwitch some needed research and development capital.

Specifically, SoftSwitch brings to Lotus its expertise in the mainframe and enterprisewide messaging integration market, messaging management and X.400 and Unix technology. It sells a mainframe-based messaging switch called Central and a Unix-based X.400 switch called EMX. Further, the move will give Lotus control over the Wayne, Pa.-based company's customer base of 600 Fortune 1,000 companies with 3 million users.

Lotus plans to buy the privately held SoftSwitch for 1.3 million shares of Lotus stock, estimated to be worth $64 million to $73 million by deal's closing. That is close to three times SoftSwitch's yearly revenue, Lotus said.

Lotus, which lost out on the recent bid for WordPerfect Corp., has been on the lookout for acquisitions to increase its communications capabilities, largely due to growing threats from Microsoft Corp. and Novell, Inc., analysts said.

Good news, bad news

Users' reaction last week was consistent with the PC LAN products they have selected. Joint SoftSwitch/Microsoft users expressed concern over SoftSwitch's ability to remain neutral. And Lotus' CC:Mail and Notes customers were moderately pleased with the promise to continue integration efforts.

The acquisition could seriously damage SoftSwitch's relationship with Microsoft, which is working with SoftSwitch to integrate EMX with Microsoft's Exchange server.

"Lotus has just compromised SoftSwitch's key strength, vendor neutrality, with this acquisition . . . It'll be difficult to give SoftSwitch early beta software to test integration," said Bill Sorsin, product planning manager of Microsoft's messaging product unit.

What's ahead

Yet Lotus and SoftSwitch vowed to continue multiplatform integration efforts. Lotus and SoftSwitch's long-term goal is to integrate Lotus Communication Server (LCS) and EMX into a combined groupware, messaging and backbone switch server, which could serve as the foundation for public Notes networks such as AT&T Corp.'s Network Notes.

SoftSwitch's Michael D. Zisman: *Acquisition bodes well for EMX*

In the near term, Lotus is considering using the Simple Messaging Transport Protocol messages transfer agent in EMX in LCS, which is due in the first half of next year.

The merger could save SoftSwitch's mainframe-based Central, which makes up the majority of the installed base, said Michael D. Zisman, SoftSwitch's president. In the past few years, SoftSwitch has had to devote limited research and development funds to EMX. "Now I see that changing," he said.

Lotus will use Central to let mainframe users front-end their mainframe-based transaction processing applications with Notes via Central. Likewise, customers could integrate mainframe-based electronic data interchange systems with Notes via Central, he said.

IBM developing Notes gateways for DCE access

By Craig Stedman

IBM confirmed last week that it is developing gateways to tie Lotus Development Corp.'s Notes workgroup software to the Open Software Foundation's Distributed Computing Environment (DCE) for a small number of customers. The computer giant is also trying to enlist Lotus in a joint project to create off-the-shelf versions of the gateways, which could then be sold with Notes.

Such an offering would give Notes users access to enterprisewide directory, security and remote procedure call (RPC) services, setting up the potential to "bridge ad hoc workgroup solutions with corporate projects that are using DCE," said Lynn Berg, vice president of distributed computing strategies at Gartner Group, Inc. in Stamford, Conn.

DCE links could provide Notes users with a single log-on capability across a network as well as transparent access to data regardless of where the information is stored, Berg said. But she noted that DCE has had "very limited acceptance in the marketplace" thus far.

Short list

IBM is taking the lead on initial Notes-to-DCE implementations that it said are being tailored for fewer than 10 customers, starting with Citibank NA. Those should start being completed "within a quarter or so," said Art Olbert, division director of LAN systems development at IBM.

IBM hopes to turn the gateways into general-use products that could be built right into Notes, Olbert added. However, both Olbert and John Bartlett, Notes product manager at Lotus, said Lotus is still gauging if there will be enough demand for the gateways.

Richard Werbin, a vice president at The Chase Manhattan Bank NA in New York, said a Notes-to-DCE link could be a useful tool for better integrating workgroups into enterprise networks. "Anything that improves Notes connectivity to other environments and mail systems sounds interesting," he said.

Server support

IBM plans to add DCE directory and security features to its LAN Server and Novell, Inc. NetWare implementations within the next year and make them capable of supporting distributed file and print applications, according to Art Olbert, division director of LAN systems development at IBM. At the mainframe level, DCE RPC interfaces for the CICS and IMS transaction monitors will be introduced in September and will ship along with DCE/MVS in the fourth quarter.

Messaging

CONTINUED FROM PAGE 1

sides between Lotus and Microsoft Corp. sooner than they anticipated.

"We've been with SoftSwitch for a long time, but now that they are with Lotus, we would certainly have to hesitate and reconsider," said Jerry Dale, an analyst at the Public Service Co. in Denver.

The utility is migrating from host-based mail to Microsoft's Mail. It currently uses SoftSwitch Central to permit users on IBM's Office Vision/MVS, Digital Equipment Corp.'s All-In-1 and Microsoft's Mail to communicate with one another and outside users. The utility had planned to buy SoftSwitch EMX to replace Central, but now Dale said he wonders, "Do we want to commit that money when they're changing horses on us?"

For others, the acquisition means putting off decisions. "If everything is changing and there is no patently clear path, we may just wait for the market to shake out a little," said Ray Zimmerman, a systems director at Northwestern Mutual Life Insurance Co. in Milwaukee.

Driving the consolidations are increasingly shrinking profit margins and a desire by desktop software vendors to control the messaging infrastructure, analysts said.

Also, users frustrated with the efforts of integrating multiple products are pushing vendors to offer complete, integrated product lines. While messaging and directory standards such as X.400 and X.500 may permit companies and their partners to buy best-of-breed products that would plug and play together, that promise is still far from realized

Drastic measure

Vendors are beginning to comply with those standards, but users say integrating different messaging systems is still a major challenge.

For instance, at a conference on business process re-engineering last week in Houston, roughly half of the 150 IS managers present said they were so tired of integrating different vendors' lines that they would forego best of breed and buy into a single vendor's solution, said Cheryl Currid, president of Currid & Co., a technology analysis firm in Houston.

More now rides on IS messaging decisions than in the past because the nature of the technology is evolving from person-to-person messaging to an infrastructure that routes information among applications. At the same time, the messaging architecture is changing from file-based PC LAN systems to client/server systems, which have greater appeal as mission-critical platforms, said David Whitten, a director at Gartner Group, Inc. in Stamford, Conn.

When in doubt, buy them out

Some major messaging acquisitions in 1994

WHO	WHEN	HOW MUCH
Banyan Systems, Inc. buys Beyond, Inc.	FEBRUARY →	$17.5M
Novell, Inc. buys WordPerfect Corp.	MARCH →	$1.4B
On Technology Corp. buys Da Vinci Systems Corp.	JUNE →	$8.5M
Lotus Development Corp. buys SoftSwitch, Inc.	JUNE →	$64M-$73M

A matter of timing

Roughly half of the installed messaging base is still on host systems. Until recently, users were stymied by a lack of scalability and management features on PCs and servers.

The next generation of client/server products is addressing those concerns so users want to move. But they are concerned about making the transition at the right time in the constantly shifting market, analysts said.

All of this means that "customers have to be even more vigilant in examining the vendors they deal with . . . many are still smarting from Wang, OfficeVision and All-In-1 decisions that they made," Whitten said.

Client/server software for mobile users ships. Page 81.

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THE EXPERTS IN DISTRIBUTED SYSTEMS MANAGEMENT

Desktop supply problems to continue

By Jaikumar Vijayan

Vendors are now scrambling to meet the steadily increasing backlogs in the desktop and notebook markets, which experienced what some analysts call an unexpected demand surge during the past quarter.

The bad news for users is that availability problems are likely to get worse before they get better. While Compaq Computer Corp. has been the most visible among those impacted by constrained supplies [CW, June 13], most major vendors face the same problem, some observers noted.

Major vendors' supply situations "are all just as bad," said Ahmad Manshouri, senior vice president of procurement at reseller Vanstar Corp. in Pleasanton, Calif.

The delta between supply and demand is likely to widen as vendors begin to drop systems prices in a bid for market share, he said. Manshouri noted that lower prices typically spur demand among those seeking to upgrade their systems and first-time buyers.

Price, however, may be only one factor impacting the current supply situation. According to analysts, other primary factors contributing to the supply woes include the following:

- Inaccurate demand forecasting by vendors, which leads to an inconsistent supply situation.
- Intel Corp.'s accelerated attempts to push Pentium as the processor of choice on the desktop. This may be creating a considerable availability gap because of Intel's apparent disinterest in selling high-end 486 DX2 and DX4 processors — especially at the high end of the market.
- Continued shortages of components such as active color monitors for notebook computers and Peripheral Component Interconnect chip sets for high-end 486 and Pentium-based systems.
- Rapidly decreasing product life cycles, which are now only a matter of months.

More and more

Despite reducing planned shipments for the quarter by 20%, Compaq is still shipping nearly 20% more systems than it did last quarter, some distributors said. Similarly, IBM has been shipping more than it did last quarter, although it, too, faces availability problems and inconsistent supplies.

According to Ron Hulak, a senior analyst at BIS Strategic Decisions, multiple orders could further compound the problem. With major distributors and value-added resellers getting jittery about being placed on limited allocations by big vendors, multiple orders could spuriously inflate the already bulging demand.

"So companies like Compaq have to decide what is a real order and what is the ghost one," Hulak said.

Shorter shelf life

Meanwhile, the constantly decreasing shelf life of products is also causing vendors to keep slim inventories, said Philippe DeMarcillac, a researcher at Dataquest, Inc.

"This is a tough business. Nobody wants to be stuck with obsolete technology," he said.

What has analysts stymied, though, are recent pricing actions by several major vendors at once when supplies are increasingly constrained. Led by a market-hungry Compaq and an increasingly price-competitive IBM, several PC vendors have dropped prices substantially in the past few weeks.

For example, Dell Computer Corp. reduced prices on its entire Dimension range of desktops by an average of $200. A Dell Dimension XPS, Pentium-powered, 90-MHz system with 8M bytes of RAM, a 540M-byte hard drive and a CD-ROM drive is now available for $2,799 instead of $2,999.

One reason for this could be that vendors are trying to move older inventory and reposition products to accommodate newer models, DeMarcillac said.

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Turn to Page 148

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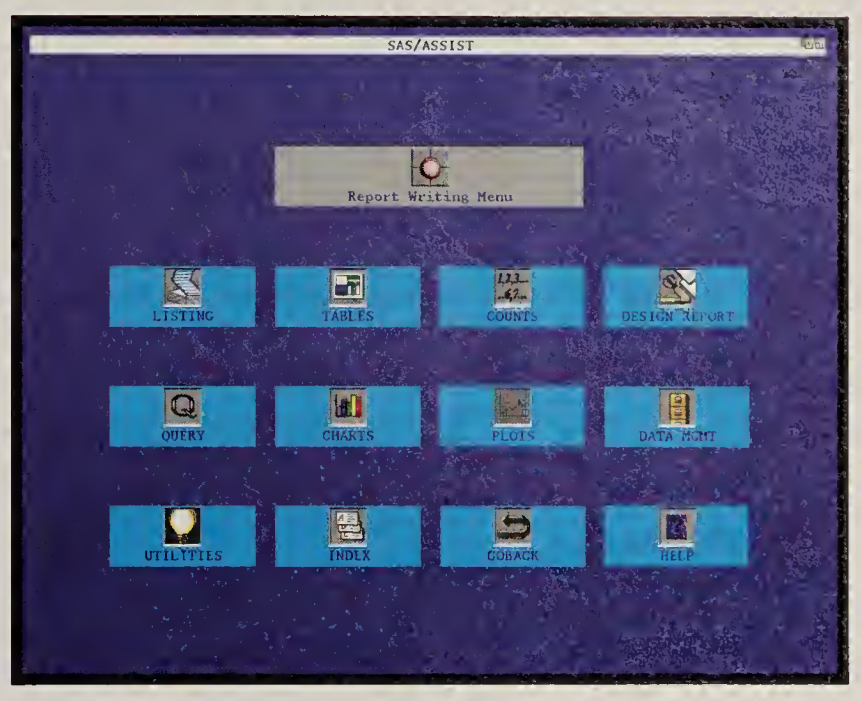

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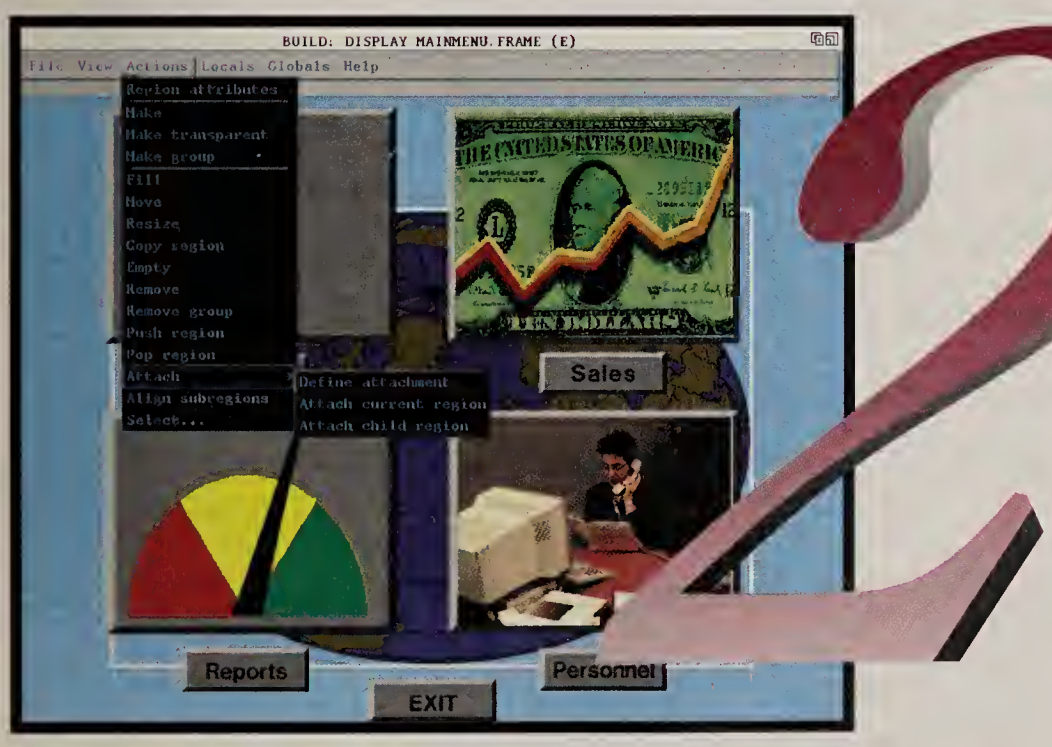

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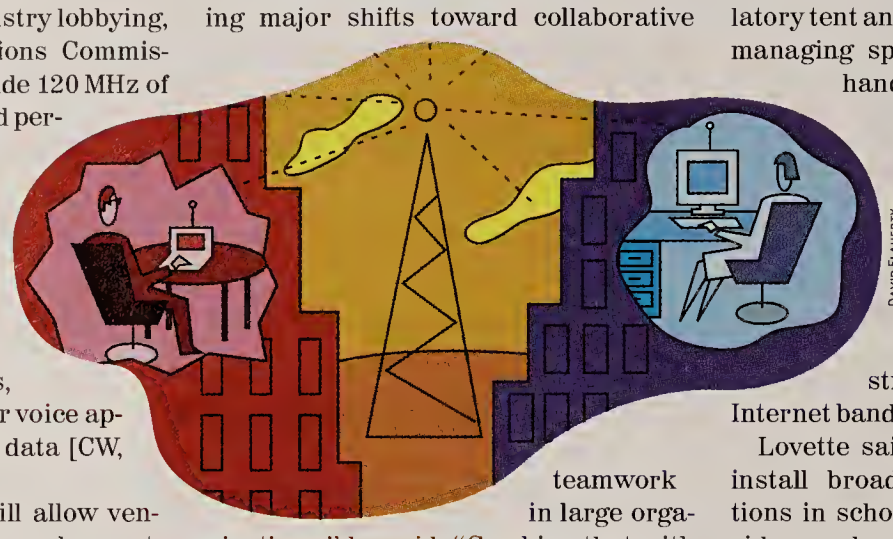
FCC makes (air) waves for wireless data

Low-cost, spontaneous LANs expected to multiply

By Gary H. Anthes

Having recently captured a tiny slice of the radio spectrum for wireless data communications, the computer industry will soon go after a much larger piece of the airwaves. The result, users and vendors say, will be a proliferation of low-cost, spontaneous LANs.

After three years of industry lobbying, the Federal Communications Commission two weeks ago set aside 120 MHz of radio spectrum for licensed personal communications services (PCS) such as portable telephones, fax machines and advanced pagers. The commission also earmarked the range from 1,910 to 1,930 MHz for unlicensed PCSs, divvying it up as 10 MHz for voice applications and 10 MHz for data [CW, June 13].



The unlicensed band will allow vendors to develop products — and users to deploy them — unfettered by the government regulations that apply to most radio communications. Low-powered, radio-based LANs operating in the approved bandwidth will be attractive to some types of users, said Jon Hulak, a senior industry analyst and wireless communications expert at BIS Strategic Decisions in Norwell, Mass.

The cost of the technology is very low — $100 to $150 per connection — and it lends itself to spontaneous or ad hoc networking, Hulak said. "Let's say you and I want to work on the same document at the same time. Using a very low-powered wireless network, I could just take my notebook computer into your cube, and we could do that."

Hulak said wireless LANs will get a boost from several emerging forces. "Within every organization there are workers who are mobile, plus we're seeing major shifts toward collaborative teamwork in large organizations," he said. "Combine that with trends in mobile computing — notebooks, subnotebooks and [personal digital assistants] — and a very low-cost, low-powered network that is a snap to use becomes very attractive."

Apple cites delay

Apple Computer, Inc., which led the industry lobbying for data PCS spectrum, said it is too soon to have firm product plans for devices operating in the new unlicensed frequency band. Microwave users in that band must first be moved to other frequencies, a process that will take about three years, according to Jim Lovette, a principal scientist at Apple.

However, Lovette said data PCS devices could be used earlier at fixed sites such as schools by a process of "frequency coordination" with local microwave users.

"Data PCS is now a reality," Lovette said in a speech last month. "We have gotten our camel's nose under the regulatory tent and set up a whole new way of managing spectrum: putting it in the hands of users."

Now Lovette wants to squeeze in the whole camel. He is urging the computer community to lobby the FCC for a whopping 150 MHz of spectrum, which he calls the "national information infrastructure band" or "wireless Internet band."

Lovette said service providers could install broadband fiber-optic connections in schools, which could then provide very low-cost wireless connections from a single entry point to individual classrooms and desktops. He said it would allow users to cut the "information umbilical cord" just as mobile computing has cut the power cord.

A lawyer who represents companies that sought the spectrum allocation said the idea of getting 150 MHz for the national information infrastructure band is not just a pipe dream.

"Once there is product on the street, it will be immediately apparent to [the FCC] that more spectrum has to be dedicated to data communications," said Henry Goldberg, an attorney at Goldberg, Godles, Wiener and Wright in Washington. He said users will lead the next campaign for spectrum for unlicensed data PCS. "They will see the value of something a lot smarter than the telephone. And unlicensed is key because it ain't gonna happen if people are paying cellular rates to move documents around."

> **"You cannot be too thin, too rich or have enough bandwidth."**
> — Jim Lovette, Apple

Henry Levine, a Washington attorney who represents corporate telecommunications users, predicted vendor applications will precede user demand for them. "Users care about wireless data communications, but they tend to be unsophisticated about specific applications until the market puts them out there. Once you have a piece of bandwidth set aside, it becomes the focus of attention and the applications begin to multiply."

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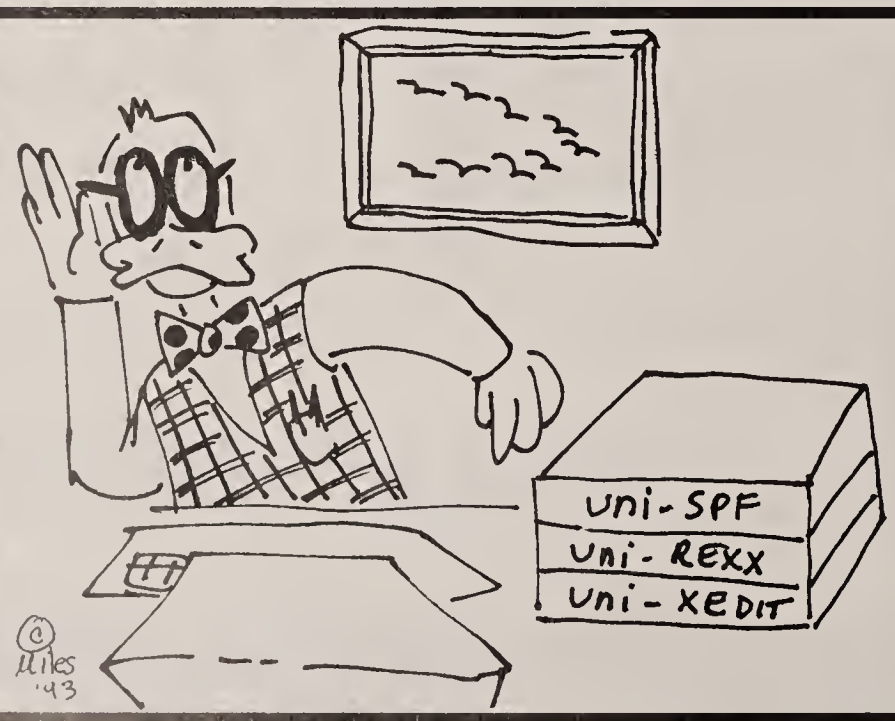

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Metricom talks up wide-area wireless WAN

By Michael Fitzgerald

Wireless vendor Metricom, Inc. dangled the tantalizing prospect of a low-cost, high-bandwidth wide-area wireless network in front of users last week. But the company stopped short of saying its wireless Ricochet microchannel data network would compete with such technologies as Cellular Digital Packet Data (CDPD).

After boasting that "we figured out a way to do wide-area networks using the unlicensed band," Robert Dilworth, Metricom's president and chief executive officer, conceded that the network did not "initially promise national ubiquity." He added that it would not be targeted toward people who travel extensively or users with total coverage needs, such as United Parcel Service, Inc.

But Dilworth said Ricochet is not at a disadvantage because CDPD and other technologies will not be nationwide for the next two years either. CDPD is a protocol designed to use the existing cellular voice network to send data; Metricom's approach uses microcellular data transmitters that are data-oriented.

Metricom's 77K bit/sec. throughput is three to four times faster than other wireless technologies. Users pay a flat rate of $3 to $30 for unlimited monthly usage, a price similar to that of land-line services.

Users said they liked the pricing and technology but wondered whether they would ever get nationwide service.

"The set price is pretty interesting, but if the technology can't be applied to where your customers are," it is only academically interesting, said Joseph Barrett, lead technical analyst at Whirlpool Corp. in Benton Harbor, Mich.

Metricom employs a mesh network that uses toaster-size microcellular data transmitters. It operates in an unlicensed band of frequency. The mesh network uses a scattershot approach that will jump data to different microcellular transmitters, rather than relying on the straight-ahead paths most wireless technologies use. Its main disadvantage is that it gives users only one channel for each transfer, as opposed to other wireless vendors that let multiple users simultaneously use the same channels.

Primary assets

Metricom's claim to fame primarily has been utility networks and controlling the water pumps in Cincinnati and Detroit. It touts its ability to handle data at up to 77K bit/sec. — much faster than the 19.2K bit/sec. top speed of rival technologies such as CDPD.

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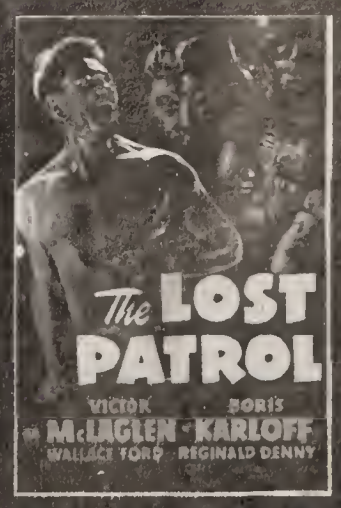

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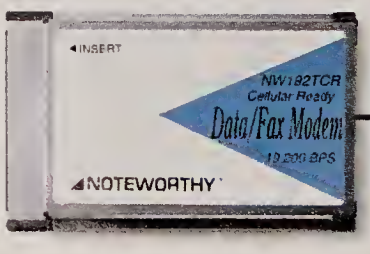

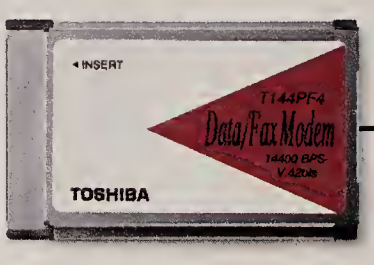

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Next

CONTINUED FROM PAGE 1

Having shed the pricey hardware and hitched itself happily to the likes of Sun Microsystems, Inc., Hewlett-Packard Co. and other hotshot partners, Next faces its first profitable year ever, claimed Steve Jobs, founder and chief executive officer.

While Jobs declined to predict exact profits, he did say Next should pull in sales of $50 million this year, compared with about $11 million last year. Further, Jobs said he expects to sell 100,000 copies of his NextStep object-oriented development system on Intel Corp.-based PCs this year — double last year's 50,000 licenses.

"We were here first, and ahead in the horse race we will remain," the ever-confident Jobs said.

The competition

That should be good news for developers gathered in San Francisco this week for NextStep Expo. But before Jobs dances a jig through his sleek Redwood City, Calif., offices, observers said, he had better prepare for another first: competition. Microsoft Corp. and Taligent, Inc. are vying for an opportunity to shoot Next through its object-oriented heart.

> "About one in 10 people I see doubt Next now. It used to be one in one."
>
> — *Vince Jordan, vice president of technology, SHL Systemhouse*

Although Microsoft has not specified ship dates for its object-oriented development tool set, named Cairo, the PC software giant has talked openly about the product for several months. Microsoft could not be reached for comment last week, but best estimates now peg Cairo as a very late 1995 product. A Microsoft executive indicated in a speech last week that it may even slip into 1996 (see story page 12).

And Taligent's object development kit is due to reach beta testing stage by March 1995, said Joseph Guglielmi, Taligent's CEO. The firm, a joint venture of Apple Computer, Inc., HP and IBM, gave "pre-beta" copies of its product to about 70 software makers, 15 corporate users and 13 universities two weeks ago, Guglielmi said.

"Next is trying to put some real value in object technology, [but] Taligent takes the concept ... and moves it way further along," Guglielmi claimed.

Jobs scoffed at Taligent in a recent interview. "Taligent's frameworks are very immature compared to NextStep today, and ... we're not standing still," he said.

Still, the clamor of product hype from larger marketing machines may be Next's biggest hurdle, said Vince Jordan, vice president of technology at SHL Systemhouse, Inc.'s Object Technology Center in Boulder, Colo.

Next is just too small to match the marketing allowances of IBM and Microsoft, Jordan said. Rivals, meanwhile, "have got people saying that no full object environments will ship until next year or even later," he said. "Excuse me? Next has been out for years."

Although Jobs talks lightly of sending his 100-member engineering staff to Hawaii for five years and still managing to whip the competition, he does worry. His corporate mission statement reads: "Next's mission is to continue to lead the object revolution and become the accepted alternative to Microsoft in the corporate market."

To accomplish that, Jobs — well-known as a willful, solo player — has had to team up with Unix heavyweights such as Sun and HP. But these partnerships have lent new credence to his small firm.

DAVID POWERS

Next CEO Steve Jobs *is well-known as a willful, solo player*

Next and HP signed a pact last year to put a portable subset of NextStep on HP/UX. Perhaps more influential was a $10 million deal with Sun, which calls for Sun to sell an operating system-independent version of NextStep, called OpenStep, on Sun's Solaris operating system.

Endorsement from those and other well-respected industry players has boosted confidence that Next has staying power, several users said. The deals have helped Next overcome a "cultish, clannish image," said Vincent Loud, MIS director at Phibro Energy, a crude oil trading firm in Westport, Conn.

The road ahead

But Next is not home free. Observers cited key problems for Next specifically and for object companies in general, including the following:

- **Scant face time with information systems.** Next employs just 23 people to do direct field sales worldwide. Twelve consultants advise users on how to build NextStep applications. Taligent and Microsoft, however, have more resources at their disposal.
- **Fewer applications.** While small vendors are stepping up, finding a mainstream word processing program, spreadsheet or personal scheduler that runs on NextStep is tough, said Jim Hohorst, senior vice president of trading product support at First National Bank of Chicago. For example, WordPerfect Corp. stopped supporting Next in January, he noted, because its installed base is small compared with DOS or Unix.
- **Slow returns.** A sizable first-time cost of $500,000 or more, plus a long learning curve, drag out the return on investment for object technology regardless of the vendor, said users who have deployed object applications. "It gets better as you get more experienced, but people have to realize that objects — any objects, not just Next — are hard work," said John Keazirian, executive vice president of information technology at NationsBanc-CRT in Chicago.

Further, Next must educate a largely object-ignorant IS population, Loud said. Object technology is esoteric for many corporate developers, which means Next has to teach in order to sell. "It can be like teaching a blacksmith about the combustion engine," Loud said.

Next has teamed with 45 third-party partners to supply NextStep applications, add-on tools and consulting. The firm has also enlisted systems integrators to help, including SHL and Perot Systems Corp.

Still, a long sales cycle buys Taligent and Microsoft some time to deliver products while Next evangelizes objects. And Next's groundwork object education may make sales that much easier for rivals when they do ship stable products, Loud said.

NextStep Expo

As NextStep picks up momentum — sales topped $8 million in the first quarter of this year — third-party providers are gearing up to fill gaps in Next's product line. Several product announcements are expected this week at NextStep Expo in San Francisco.

For example, new NextStep hardware from Canon Computer Systems, Inc. is slated to be demonstrated. Canon, which owns 16% of Next and sits on Next's five-member board, plans to ship a NextStep workstation this week. The hardware is a 486 DX4, 100-MHz machine that — you guessed it — will be painted black. The boxes, which will come preinstalled with NextStep 3.2, are priced at $6,500, a spokesman said. A low-end model will be less than $5,000, he said. — *Kim S. Nash*

Ilog announces C++ tools

By Melinda-Carol Ballou

For corporate developers seeking to distribute object-oriented C++ applications across the network, Ilog Corp. last week announced two products said to greatly facilitate the process: Ilog Broker and Ilog Server.

Using Ilog Broker, programmers can take a C++ application and distribute it with minimal effort by changing its header file using a series of 15 keywords, company officials said.

Industry analysts said the Ilog products could provide a much-needed bridge between client/server and object-oriented development as programmers create distributed applications.

Ilog Broker's keywords facilitate the process for distributing applications, indicating whether the object class ought to be distributed, for example. Once the header files have been annotated using the keywords, Ilog's preprocessor automatically generates the source code to build the distributed application.

Ilog Server lets developers build dynamic servers of C++ objects, allowing multiple users to access those objects. This allows groups of developers to create complex, C++ object-oriented systems, which previously was extremely awkward.

Call waiting

The Ilog product generates remote procedure calls to handle communications between objects. It supports C++-based object request brokers and the Object Management Group's Common Object Request Broker Architecture (CORBA).

Long Island Lighting Co. used the Ilog products to develop an application that schedules all the work done at the utility — "everything from building a power plant to putting a meter on the wall," said Peter Fiedelman, director of corporate systems.

Using the Ilog products, "people who need to invoke services don't need to know the technical details but merely need to know the interface rules," Fiedelman added.

Linkvest SA, a Lausanne, Switzerland-based systems integrator that works with 50 financial institutions across Europe and most of the major Swiss banks, is bringing in the Ilog products for use with its customers.

"One of the biggest problems we had working with the Swiss stock exchange was that we not only had to send messages to the server, we also needed to receive messages back that orders were completed and received," said Jean-Marie Jacazio, Linkvest president. "The Ilog products solve the interoperability problem in a very simple and clever way."

Ilog Broker and Ilog Server are both shipping now for Unix workstations and are priced, respectively, at $5,000.

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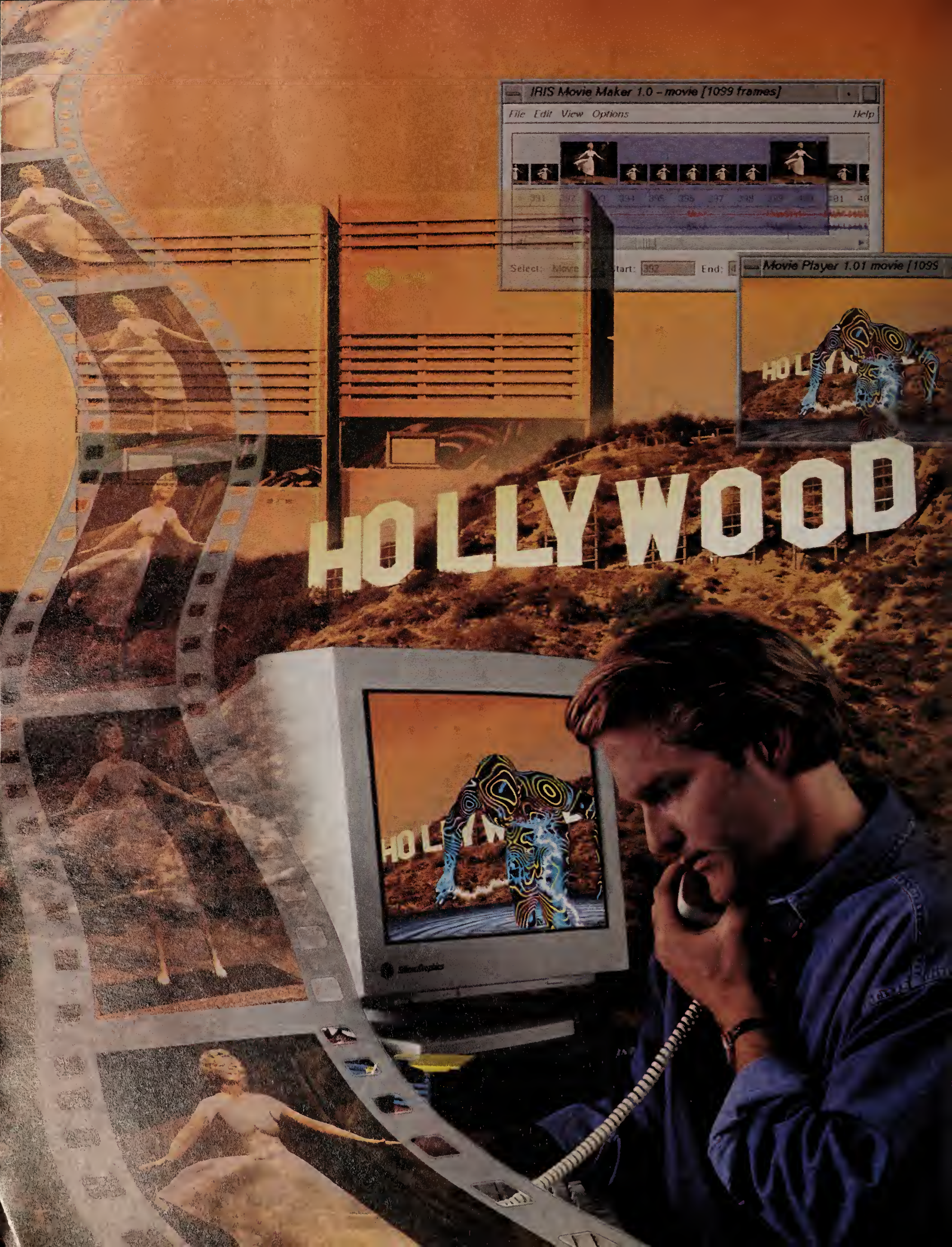
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Briefs

Burl gets 'Focused'

Micro Focus, Inc. in Palo Alto, Calif., earlier this month announced it will acquire all outstanding shares of stock for **Burl Laboratories, Inc.** in Raleigh, N.C., for roughly $13.5 million. According to Micro Focus, Burl Laboratories has an analysis tool for Cobol systems that will complement Micro Focus' development tools. Burl Laboratories will act as a research and development laboratory after the acquisition's completion, the company said.

NCD warns investors

Network Computing Devices, Inc., a Mountain View, Calif., supplier of X Window System terminals, said its second quarter ending June 30 will fall well below analysts' estimates of up to 11 cents per share. Record revenue had been expected. The company cited increased competition, delayed delivery of a new version of its PC-to-Unix integration software and pricing pressures from the desktop computing market as affecting gross profit margins.

Chip maker ups sales

Chip maker **National Semiconductor Corp.** reported a profit of $82.4 million for its fourth quarter ended May 29, up from $46.2 million the year before and higher than Wall Street analysts' projections. Sales rose from $557.9 million to $609.4 million. For fiscal 1994, the company had profits of $264 million on sales of $2.3 billion.

Egghead reports loss

For its fiscal year ended April 2, **Egghead, Inc.** in Issaquah, Wash., reported a loss of $500,000 on revenue of $778.3 million. Fiscal 1993 earnings were $6.9 million on revenue of $725.4 million. Egghead also settled a shareholder's lawsuit filed in September for $2.63 million. Court approval is required for the settlement, which will result in a $1.2 million charge in fiscal 1994.

Phone services cross wires

Long-distance providers enter local arena as Baby Bells look to branch out

By Ellis Booker
CHICAGO

For years now, the local loop telephone network has experienced a measure of business challenge from competitive access providers such as Metropolitan Fiber Systems, Inc. More recently, long-distance service firms, joined by cable and wireless companies, are entering the game and putting additional pressure on local telephone companies.

An "open" local loop spells good news for customers.

"Every time competition has impacted one of [the Bell's] revenue streams, prices have gone down and responsiveness has gone up," said Raymond Liguori, a vice president at Salomon Brothers, Inc. in New York.

Meanwhile, Bell companies are making inroads in their efforts to enter the long-distance service arena, a marketplace currently prohibited to them under the 1984 Consent Decree that broke up the Bell System. Last week, the U.S. Department of Justice's antitrust division said it would support the Bell companies' entry into long-distance services with their wireless services. The antitrust division also said it would allow the Bells to resell long-distance services as part of their wireless services.

Rochester Telephone's *John Purcell: Expand network by increasing demand*

Two weeks ago, AT&T Corp. announced Accu-Ring, a 45M bit/sec. metropolitan fiber ring service that AT&T will configure from existing access networks in virtually all the top business markets.

AT&T's move follows a plan announced earlier this year to build fiber-based bypass rings in the nation's 20 largest cities.

Another player is MCI Communications Corp., which said its primary motivation for entering the fiber ring arena is to skirt the fees it now pays local phone companies to reach customers. These access charges are the single largest expense for interexchange carriers, and in MCI's case, represent 45 cents on every dollar the company collects.

"The other part of their agenda is to have direct control of their largest business customers," Liguori said. The first MCI Metro ring is now being built in Atlanta.

Into the great wide open

At the same time, new technologies and business alliances — notably in the cable and wireless arenas — suggest increasingly powerful alternatives to traditional telephone company networks.

Topping the list of relationships is US West's investment in cable giant Time Warner, Inc. and the proposed mergers of AT&T and McCaw Cellular Communications, Inc. and MCI and Nextel Communications, Inc., which could produce powerful wireless companies that target local markets.

Meanwhile, regulatory and legislative initiatives at the federal and state levels are increasing the prospects for an "open market" local loop.

Yet despite the pressure, "competition will be one of the best things that ever happened to most of the regional holding companies over the long term," according to a Salomon Brothers Telecommunications Services report issued last month.

The Salomon report — titled "Baby Bells — Ready for a Fight?" — argues that the "inevitable" loss of market share for their core businesses will force the regional holding companies to grow revenue in other areas.

"Our theory is [that] the best way to extend our network is to increase demand for it," said John K. Purcell, corporate vice president at Rochester Telephone Corp., which has proposed the most open local telecommunications market in the country. It features fully unbundled, "wholesale" network services that are available to all comers, as well as an interconnection of competing local networks (see story below).

Then what?

What this will mean for users, or for the telecommunications services they currently enjoy, is less clear.

For instance, the open market could have a leveling effect on the price differences that now exist between the local telephone companies and their nimble competitive access competitors.

Liguori noted that it will be several years before the built-in subsidies for local phone service are ironed out. Also, pure price competition will not be a suitable strategy for carriers in the open loop, he added.

Indeed, the competitive emphasis will likely shift from the network to the applications that run across it.

Once basic dial tone becomes a "commodity" available from any number of companies, "what people are going to buy are applications," said Tom Phelps at HPA Telecom Group, Inc., a Rochester, N.Y.-based consulting and sales company.

In an open local telecommunications market, Phelps predicted service companies would spring up that use such a device to provide value-added network services.

More is less

Users are generally confident that competition for local network services will result in better prices. "Competition is always good. It always drives the price down," said Hughes Aircraft Co. CIO James Woods. But the potential dark side of a robust local loop with lots of competing carriers is interoperability. "When I'm trying to put this into a seamless infrastructure, I'll now be dealing with much more diverse combinations and standards," he said.

The wave of the future?

Leading the charge for an open local loop is the plan put forth last month by Rochester Telephone, which serves 1.5 million customers through 49 telecommunications companies in 22 states.

In mid-May, Rochester Tel announced an agreement with the New York State Public Service Commission to fully open its local network to competition next year.

The plan, which must be approved by the full commission, calls for dividing Rochester Tel into regulated and unregulated parts. The competitive and unregulated company, R-Com, would operate as a retail provider of integrated communications services.

Last week, Rochester Tel picked David G. Rusin, formerly president and chief executive officer of Eastman Kodak Co. subsidiary Edicon Systems, to head R-Com.

R-Com will buy services from R-Net — the default carrier for customers who do not choose an alternative carrier — which will also sell its basic, unbundled network services to other providers.

In addition, the plan calls for full interconnection of competing local networks, including reciprocal compensation for terminating traffic, equal access to network databases, access to local telephone numbers and number portability.

— Ellis Booker

A Salute to the Winners

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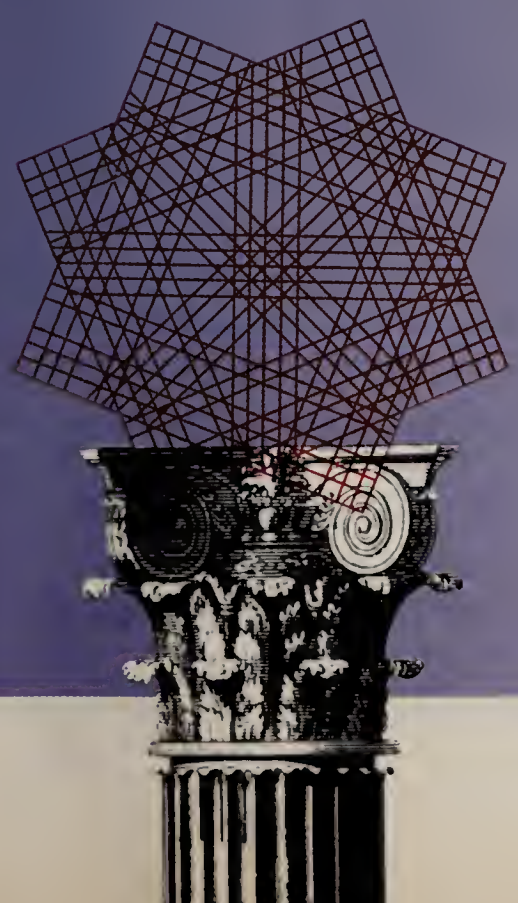

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Editorial

Justice for all

The message in this space last week urged the U.S. Department of Justice to scrap an ancient consent decree and allow IBM to compete on a more level playing field.

The Justice Department is currently at the epicenter of efforts to speed the deregulation of the telecommunications industry. These efforts hold greater ramifications for corporate users than the 1956 Consent Decree, given the meteoric growth in the volume of digital data that companies transmit and the similar rise in the cost of doing so.

Unfortunately, the baseline issues of deregulation are often drowned out and confused by as loud a chorus of whining, complaining and finger-pointing as you'll ever witness. Most of this is self-serving posturing that the Justice Department must vigorously ignore to bring the full fruits of competition to corporate users.

Consider the pleas of the Baby Bells to purchase and then resell long-distance services over their wireless networks. These networks are primarily voice-oriented, but in a few short years, mainstream computer data will flow over them.

Anyway, AT&T is fighting the Baby Bells' request. The Bells, AT&T says, would use monopoly power in their regions to control the wireless market. Hmmm. I wonder if AT&T says this because it is the same strategy AT&T will employ if its plan to acquire cellular phone giant McCaw Communications is approved?

The McCaw purchase has been opposed by — you guessed it — one of the Baby Bells, BellSouth. Confusing? Not really. Just think of it as a huge game of "Do as I say, not as I do."

The Justice Department is also involved in efforts to make the global telecommunications market more competitive. Sprint wants to sell 20% of itself to the German and French phone companies while British Telecom wants a similar-size piece of MCI.

AT&T's position on these proposals can be summed up in two words: "We object!" Meanwhile, AT&T is attempting to forge its own alliance with other European phone companies.

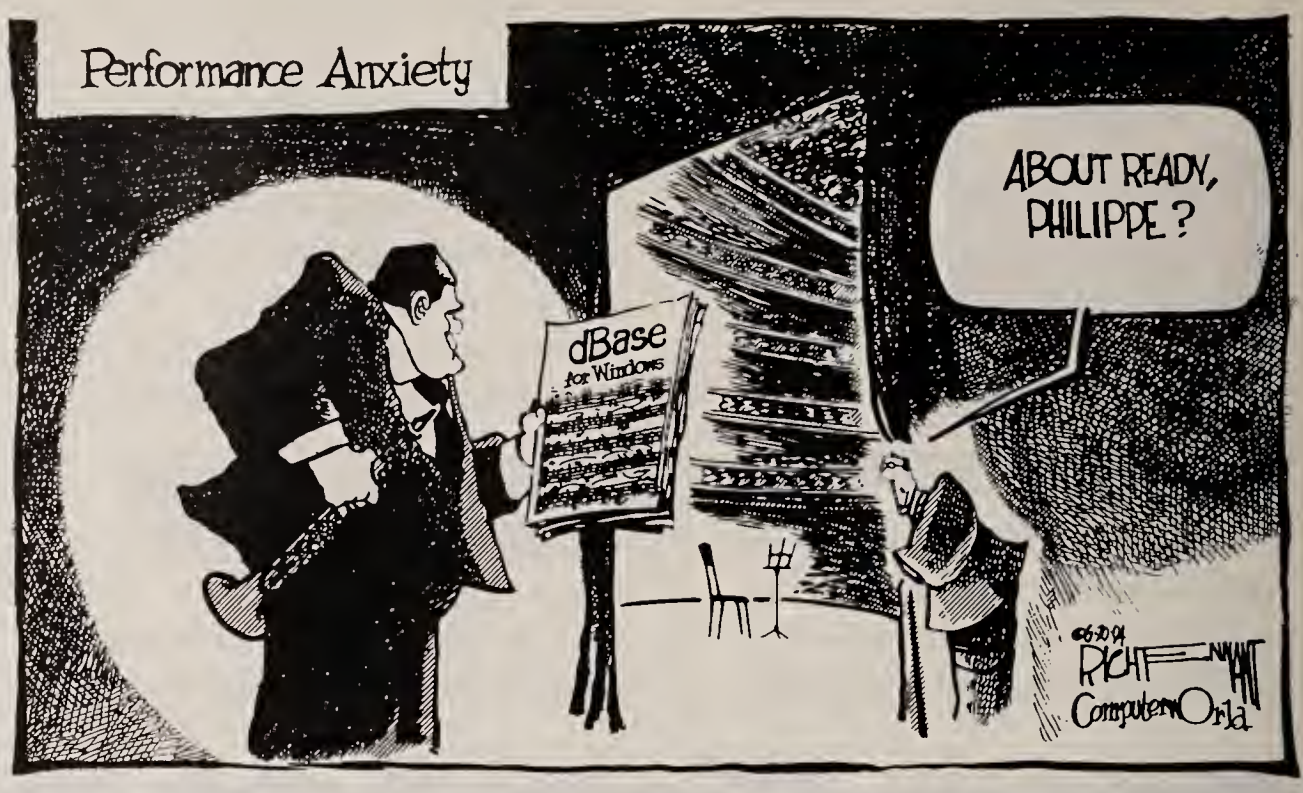
I recall last fall when Novell and WordPerfect were freely leaking information about the ongoing antitrust investigation of Microsoft. Moods changed when we asked about possible congressional committee hearings into market dominance, hearings that were rumored to include Novell's massive share of the LAN market.

The Justice Department and federal regulatory agencies have to become totally single-minded in their actions. That single-mindedness should be guided by an obsession to foster competition, which will inevitably lead to lower prices and expanded services.

The winds blowing from Washington have been refreshing on this subject, for the most part favoring an overall broadening of the competitive landscape in telecommunications. It is at least one thing the current administration is getting right.

Bill Laberis

Bill Laberis, *Editor in Chief*



Letters to the editor

Just do it

"Is Cobol dead?" [CW, April 25] made some fine points on both sides. The most important point is to get to work and get the job done.

John Cunningham seems to overlook the point that Cobol exists on virtually every platform now. Reusability has already been achieved by several companies. Reason tells me that Cobol can easily populate objects, too. Alan Pursell ignores the fact that someone trained in Smalltalk or Natural gets the job done.

Pursell and Cunningham both ought to be using "high-level" tools to construct and maintain systems of any size. The rules of the road are simple:

- Reusable modules should be used for construction. Go to reusable application modules as soon as possible.
- Select a set of tools for design, project management, testing and coding, then use those tools.
- The construction process should clearly identify the objects or reusable portions to make debugging and long-term maintenance simple.
- Custom or unique code should be held to 5% or less for any system.
- Any trained person should be able to easily pick up another's work and make modifications.

David L. Thompson
Norcross, Ga.

ABC spells common ground

"As easy as ABC?" [CW, May 23] says information systems staffers will be called on to provide support to their organizations if they pursue activity-based costing (ABC). I hope so! IS personnel are skilled in process modeling and identifying sources of key data within their organizations. Senior management would be foolish to look elsewhere for that information.

I predict that ABC systems will be one of the emerging "killer apps" in the client/server world. Why? IS has been haunted by its inability to show business value for what it provides. ABC and activity-based management are the common ground in the turf battles between chief financial officers and chief information officers.

Bob Moran
Bound Brook, N.J.

'Engineer' is a hard-earned title

The comments in "Engineers to IS: Drop that title!" [CW, May 30] on the "preposterous" nature of professional engineer registration laws illustrate exactly why such title protection acts exist. Ignorance of the law is not an acceptable excuse.

Contrary to the position of George Phelps, states have very specific definitions of what an engineer is, just as they have very specific definitions for a doctor of medicine. Engineers are professionals who must meet certain minimum requirements of education, experience and knowledge as demonstrated in rigorous sets of tests. Engineers must also adhere to a stringent code of ethics with regard to their professional practice or face possible disciplinary or legal actions. If Phelps were licensed as an engineer, he could legally practice in only those disciplines in which he has demonstrated competence, not as "any type of engineer," as he states.

Ross Flaherty's statement regarding locomotive "engineers" is totally without merit. Virtually every state professional engineering title act provides an exemption for this category as well as for other categories of "engineers," such as a stationary engineer.

I would suggest that if Phelps and Flaherty wish to call themselves engineers, they should make the significant investment all other professional engineers are required to make and obtain the necessary education, experience and passing test scores in compliance with the applicable laws of their respective states.

Gary L. Franks
Perrysburg, Ohio

BEST COMPUTER NEWSPAPER 1992, 1993
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■ Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: 279-6273; Internet: letters@cw.com. Please include a phone number for verification.

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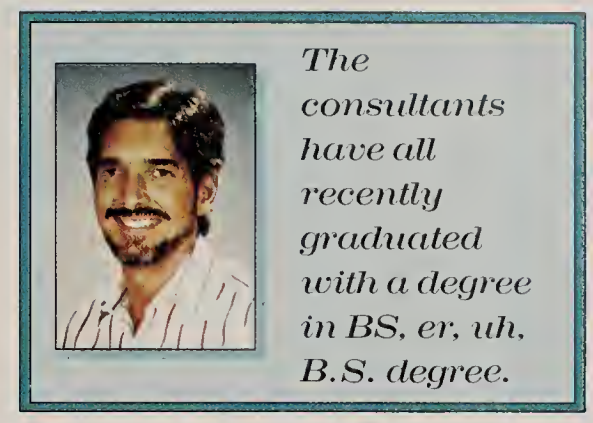
Ability to baffle consulting

Tim Lynch

The project begins and the consultant says to the project manager, "Here we are! All of your problems will be solved by our crack team, fresh from our internal training. They have all recently graduated with a degree in BS, er, uh, B.S. degree, and they know all they need to know. And as you will soon see, our company has a complex turnscrew, er, uh, turnkey system that has the capability to replace all of the individual systems you are using to run your mega-million-dollar operation.

"Yes sir, you signed with the right vendor. And to prove it we are scheduling a group conference to further befuddle, er, uh, to further begin to tight-lip, er, I mean, the tightship communications that we are so well-known for. We have many references you may contact to ensure the success of our previous disast, er, endeavors. Just ask me for the phone numbers, and I'll put you in direct contact with our well-paid, er, uh, well-informed references. And we must congratulate your people in that they have read all the "fine" print of our contract before signing; that's only good business sense. By the way, we apologize for disabling your loading dock for a few days when we delivered the contract.

"We expect you will be up and running in a year. Our system and our people will quickly replace all of the software you have developed, fine-tuned and secured during the last 10 to 15 years. We realize there may be a few minor problems along the way, such as unexpected monies spent on hardware, software and training, some travel expenses, additional maintenance costs for outside support people to screw up, er, um, fix up your current systems software, some emergency beepers, a bit of an increase in sick time as well as additional turnover, some loss in morale, new costs for additional software security, maybe an unhappy customer here or there, possibly a government fine due to delays in regulation reporting and a few monthly, um, er, minor delays in delivery of data.



"But don't worry, you have full support from your CEO and CIO. We convinced them that this is the way if they expect to be living in two years. They understand our system and the ease with which it can be implemented due to our ABBG [ability to baffle the big guy] policies.

"Soon we will contact employees involved in this implementation to schedule them to attend our training center here in Sucker Flats. They will enjoy and benefit from the time spent with our professional trainers who teach using our company's native tongue: Fleesu. It is a cross of French, Latin, Greek, Spanish and Uguruanian. We sometimes find a little difficulty in communicating, but we have convinced your CEO that he should replace those who just don't get it. In that case, we'll find people who need to feed their children, er, who can do what we want.

"When it is all done, sometime next century, er, uh, year, and we have shown you the way to software near bankruptcy, er, uh, nirvana, we here at KCWWB [Keepum-Confused-While-We-Billum] Consultants can all look back and be proud of all the money, er, uh, progress we have made!"

Lynch is a senior analyst at Florida Power & Light Co. in Juno Beach.

The Bell Data Network: It's alive

John Gantz

I always felt that somewhere deep within the belly of AT&T, perhaps in a windowless office at Bell Labs, the Bell Data Network conspiracy lived on. Now I might have proof. Old-timers in this business may remember the Bell Data Network, as it was called in internal AT&T documents 15 years ago.

The brainchild of Bell Labs, this was to be the ultimate data network — one that would support the communication of any terminal with any other thanks to protocol conversion services embedded in the network.

Eventually the Bell Data Network, renamed internally as the Advanced Communications Service, was released as the AIS/Net-1000. Alas, the AIS/Net-1000, as ungainly as its name, sank from sight along with a billion development and marketing dollars. A great idea but impossible to implement, its only visible legacy was the infamous network "cloud," the amoeba-shaped figure used in graphical descriptions of the network.

While the network disappeared from sight, it didn't go away. It reared its head in the 1980s, for instance, as AT&T's plan to build a public SNA network for big companies. At one point, I was asked to help AT&T gauge the market for the network, but when I remarked that it reminded me of the AIS/Net-1000 and suggested that a premise-based solution might be better, I was ushered out the door. Then I knew the conspiracy was alive.

Like a century plant on a different timetable, the Bell Data Network is destined to bloom every 10 years. The incarnation for this decade is AT&T's NetWare Connect Services, where the cloud this time is a public network based on Novell's NetWare.

Once again AT&T's goals are laudable. The world truly could use a ubiquitous, trouble-free, well-maintained Novell network to which we could all log on, just as in the 1970s we could have used a network that would let our IBM glass teletypes talk to our Honeywell mainframes.

But good intentions aside, how is AT&T going to pull this off? Will it buy 1,000 routers and build a giant Novell network it can subdivide into smaller virtual LANs? Will it custom-build a giant switch in the middle of the country and write a gazillion lines of code to make it work? Can it build for the U.S. what even large companies are having trouble doing — a multimillion name directory? Will it train an army of Novell certified technicians to run the thing? How will it handle billing?

AT&T NetWare Connect Services, along with AT&T Network Notes and soon an AT&T Microsoft something look, again, like protocol-specific reductions of the original Bell Data Network. And they face the same challenges that network faced back then — actually working. This means accommodating the customization that compels companies to install their own equipment, offering solutions that are cost-competitive with customer-owned facilities and providing control and configuration services as flexible as those of private network operators.

I know many of you would like an angel of mercy to swoop down and rescue you from an increasingly tough-to-manage tangle of internetworked LANs. I would too.

But NetWare Connect Services is going to be one of those services you will want to see in operation with live customers. You must kick its tires. It's your only protection against the conspiracy.

Gantz is senior vice president at International Data Corp. in Framingham, Mass. He is responsible for all research and consulting in desktop automation and workgroup and office computing.

Hewlett-Packard computer systems helped Spalding's worldwide revenue grow four times faster than the industry average.

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— Bard White, Spalding's CIO and Worldwide Director of MIS

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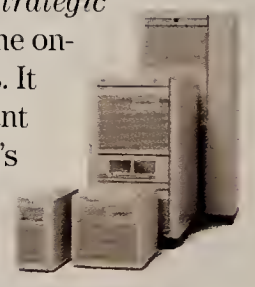

Think again.

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1993 Hewlett-Packard Company CSY9306

Virus fighters face expanding threat

By Gary H. Anthes

The increasing sophistication of computer viruses, as well as the growing trend to connect to the Internet, is leading companies to strengthen their computer incident response teams.

After the U.S. Department of Defense established its Computer Emergency Response Team (CERT) at Pittsburgh's Carnegie Mellon University in 1988 in the wake of the notorious Internet worm, several other federal agencies and companies set up response units.

TI's Tim Saltmarsh: *Viruses outstrip current capabilities*

A year later, the National Institute of Standards and Technology (NIST) established the Forum of Incident Response and Security Teams (FIRST), a volunteer group intended to be an information clearinghouse and coordination point for the various response teams in government, industry and academia. More than a third of FIRST's 34 members are U.S. corporations.

"It appears that most of the growth in FIRST in the past year has been in the corporate world," said John Wack, head of computer incident handling at NIST. "There's been an explosive growth in connections to the Internet. [Companies] are looking at the potential liabilities of an Internet connection and looking for ways to gird for that."

IBM's CERT guidelines

- Deploy antivirus tools widely, although 100% deployment is neither possible nor desirable.
- Update antivirus tools at least quarterly for "high-risk" users, at least twice a year for others.
- Report viruses centrally. Otherwise, users may simply eradicate them and go on with their business.
- Make virus incident reporting procedures clear and simple.
- Promote a "no recriminations" policy for infected users.
- Promote a general attitude of helpfulness from the central CERT.
- Ease access to the latest versions of antivirus tools.
- Use regular surveys to test whether processes and policies are consistently implemented.

New challenges

Texas Instruments, Inc. has had its Site Virus Fighter Team for DOS-based PCs in place for several years, but it is beginning to expand its incident response capabilities to include a broader array of security risks, such as Internet-borne "password grabbing" and interpreting. The team is also helping to implement security alerts from other CERTs.

According to Tim Saltmarsh, TI's manager of information security, increased Internet use and smarter viruses are driving companies to strengthen their response capabilities.

"Viruses are becoming more sophisticated, and the threat continues to grow," he said. "We're seeing viruses we've never seen before, and a lot of the antivirus software doesn't catch up to them for two to three months."

"New technologies such as wireless communications devices, laptops and work-at-home situations are rapidly changing our environment," said John J. Kinyon, network security manager at Motorola, Inc. "Everyone now uses

Viruses, *page 41*

Vendors seek suite victory

Lotus, WordPerfect play catch-up in packaged software market

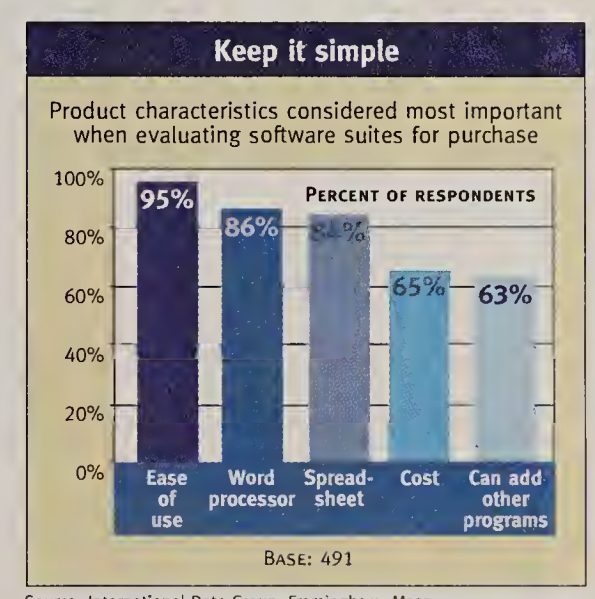
By William Brandel

■ The distant No.2 and No. 3 software suite vendors will again try to make a play for application suite users when they announce new offerings at PC Expo in New York next week.

Lotus Development Corp. will introduce a new version of SmartSuite, with upgraded versions of its Approach 3.0 database, 1-2-3 for Windows Version 5.0 and Ami Pro 3.1. The suite will be available in the third quarter and will support the Notes/FX application programming interface.

It is too early to tell if either Lotus or WordPerfect Corp. will have what it takes to slow the red-hot momentum of Microsoft Corp. in this market. It is clear that each intends to compete against Microsoft by building on its own single application installed base.

Microsoft holds a commanding 80% market share of the 2-year-old application suite market, according to Gartner Group, Inc., a consultancy in Stamford, Conn. Lotus takes up most of the remainder of the market, while WordPerfect, with its suite using Borland International, Inc.'s Quattro Pro spreadsheet and Paradox database, holds a sliver of the market.



Source: International Data Group, Framingham, Mass.

A tougher road ahead

Microsoft's dominance is partly due to the early lead it gained by introducing suites more than two years ago and by anchoring its suite on some of its popular Windows-based applications. However, Lotus' SmartSuite has increasingly chipped away at Microsoft's market stranglehold since its launch 18 months ago. Furthermore, Microsoft is expected to face stiffer competition from WordPerfect, which is slated to enter the market with a much more viable product than its past lackluster efforts with Borland.

"It's a very different situation for WordPerfect now," said Mary Conti-Loffredo, an analyst at International Data Corp. (IDC), a consultancy in Framingham, Mass. "It makes a major difference when you have one company developing and marketing the suite."

In an effort similar to Lotus' targeting its massive 1-2-3 spreadsheet audience with SmartSuite, WordPerfect is trying to reapproach its large WordPerfect word processor market base with a more integrated, versatile and smartly packaged array of suite offerings [CW, June 13]. WordPerfect's past late-in-the-game efforts to sell a loosely coupled Borland Office suite have failed to hold down a large chunk of its installed base.

"We used to be a WordPerfect shop," said John Chamberlin, a superintendent of system and coordination at Tosco Northwest Co. in Ferndale, Wash. "But when we went to Windows, we dropped WordPerfect."

Tosco, like many other sites, moved to a Windows-based suite because of the low price point of a combined set of offerings and because the suites offer a uniform user interface that gives each application a common look and feel.

Looking to deploy low-cost Windows-based applications on end users' desktops, Tosco standardized on Lotus' Windows-based suite, while its sister company standardized on Microsoft's Office. At Tosco, the choice to anchor its suite for its 1-2-3 spreadsheet user population won out because Lotus had an integrated Windows-based suite offering when Tosco was in the market for one.

However, Chamberlin said 20% of Tosco's end users stubbornly hang on to their WordPerfect word processors and have not converted to using Lotus' Ami Pro word processor.

It is sites like Tosco — where loyal end users cling to their WordPerfect word processor or 1-2-3 spreadsheet — upon which WordPerfect and Lotus are gauging their strategies.

Opportunity knocks

Currently, 43% of information systems sites have ventured into using suites, according to IDC, which leaves the other 57% up for grabs. And while a sizable population of Microsoft Excel and Word users exist in the market, there is still a large opportunity to leverage the population using both 1-2-3 and WordPerfect.

According to IDC data, the combination of low-cost applications and the integration of these via a common user interface has driven Microsoft's suite success. First-time suite purchases account for more than 72% of suite sales, while upgrades to the same vendor account for just under 18%. Competitive upgrades, an area in which Microsoft or Lotus has succeeded in wooing a complete change of applications on its desktop, make up only 10% of suite sales.

However, to leverage their respective and combined installed application bases, both WordPerfect and Lotus have to overcome Microsoft's technological and market lead. Lotus is planning its major SmartSuite upgrade as a 32-bit, Object Linking and Embedding (OLE) 2.0-compliant suite that will run with Microsoft's Chicago operating system (Windows 4.0), which is due to ship in 1995.

Perfect fit

WordPerfect will make its move this fall, aiming its first OLE 2.0-compliant suite at the large 1-2-3/WordPerfect installed base. Using its PerFectit technology, users will be able to merge 1-2-3 and WordPerfect under the same user interface, according to industry sources.

"There are a lot of shops out there with both 1-2-3 and WordPerfect," said Matt Cain, an analyst at Meta Group, Inc., a consultancy in Westport, Conn. "Giving these users the opportunity to remain in their 1-2-3 and WordPerfect environments in a suite would certainly be a plus."

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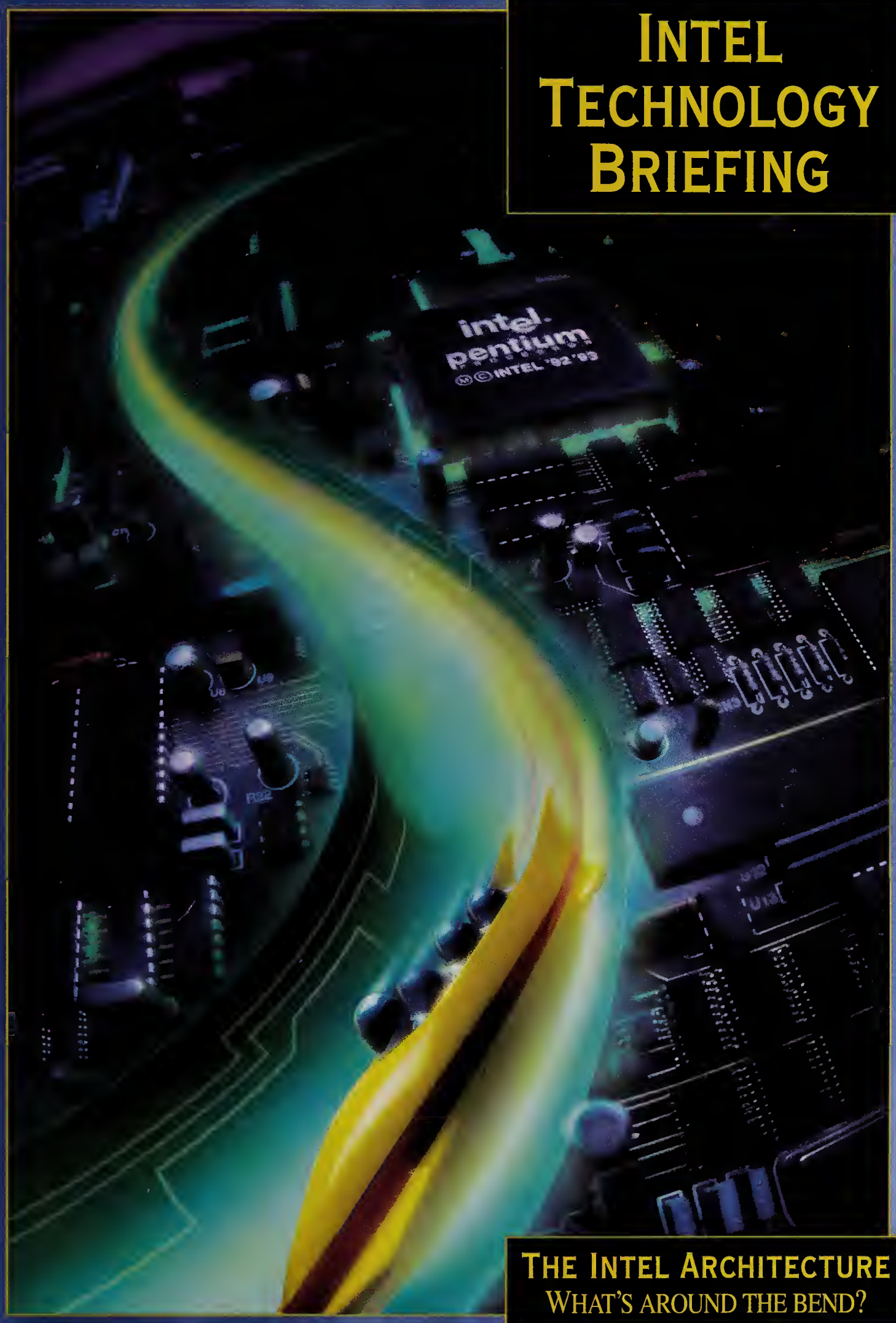

The Intel Architecture

What's around the bend?

THE NEXT GENERATION OF PROCESSORS. COMING IN RECORD TIME.

During the past 15 years, Intel has introduced five generations of processors. So what's next? This technology briefing will discuss how Intel is delivering faster processors with less time between generations by combining the Intel Architecture with innovative design and manufacturing techniques. We'll even look at our new processor, code named "P6," available in 1995.

A FOUNDATION TO BUILD ON.

From the 8088 processor through the new "P6" processor, one thing has remained compatible—the Intel Architecture. But what is it?

When most people think of architecture, they think of different styles of buildings. An architect would give builders different "instructions" for constructing a Victorian-style building than a Gothic-style building.

Microprocessor architecture is similar. Intel is like the architect. We give software developers a set of instructions for writing programs. The Intel "style" of instructions, registers and memory management has remained consistent across generations. Which means the many programs already written for the Intel Architecture will be upwardly compatible with the new "P6" processor.

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In order to maintain compatibility while increasing performance, Intel must constantly develop new design techniques. We don't change the "rules" of the Intel Architecture. Instead, we make it run more efficiently.

For example, we gave the Pentium™ processor multiple pipelines for simultaneous instruction execution. In addition, we gave it 64-bit data paths, separate 8 Kb data and code caches, and a branch prediction unit to keep information flowing into the processor as quickly as possible. And we're continuing to improve the Pentium processor, which will run at clock speeds of up to 150 MHz in the next version. The "P6" processor will incorporate even more sophisticated techniques to execute instructions at over 250 MIPS.

CAN YOU BUILD IT?

Even the best design ideas are useless without the ability to economically implement them on-chip. That's why Intel expects to invest $3.5 billion this year alone in R&D and equipment—substantially more than any other semiconductor manufacturer. By predicting the manufacturing technology available years from now, we can plan today which design techniques will be possible for use in tomorrow's processors.

By developing new manufacturing processes, we are able to fit more and more transistors into smaller and smaller spaces. Not only does this allow us to add new capabilities to each new generation of Intel processors, it allows us to shrink the processors within each generation—resulting in faster performance and lower-power chips such as the 100 MHz, 3.3-volt Pentium processor.

What's more, Intel's manufacturing capacities enable us to produce tens of millions of processors every year. Enough to fill the demand as computers move into more and more households.

THE INTEL ARCHITE

THE INTEL ARCHITECTURE—A SET OF INSTRUCTIONS OR "RULES" OF OPERATION—HAS BEEN SIGNIFICANTLY ENHANCED SINCE ITS 16-BIT ORIGINS IN THE 8088 AND 80286, WITHOUT LOSING ITS SOFTWARE COMPATIBILITY. ALTHOUGH

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INTEL386™ PROCESSOR
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32-BIT INSTRUCTION, REGISTER AND DATA BUSES

INTEL PROCESSOR ROADMAP

ECTURE

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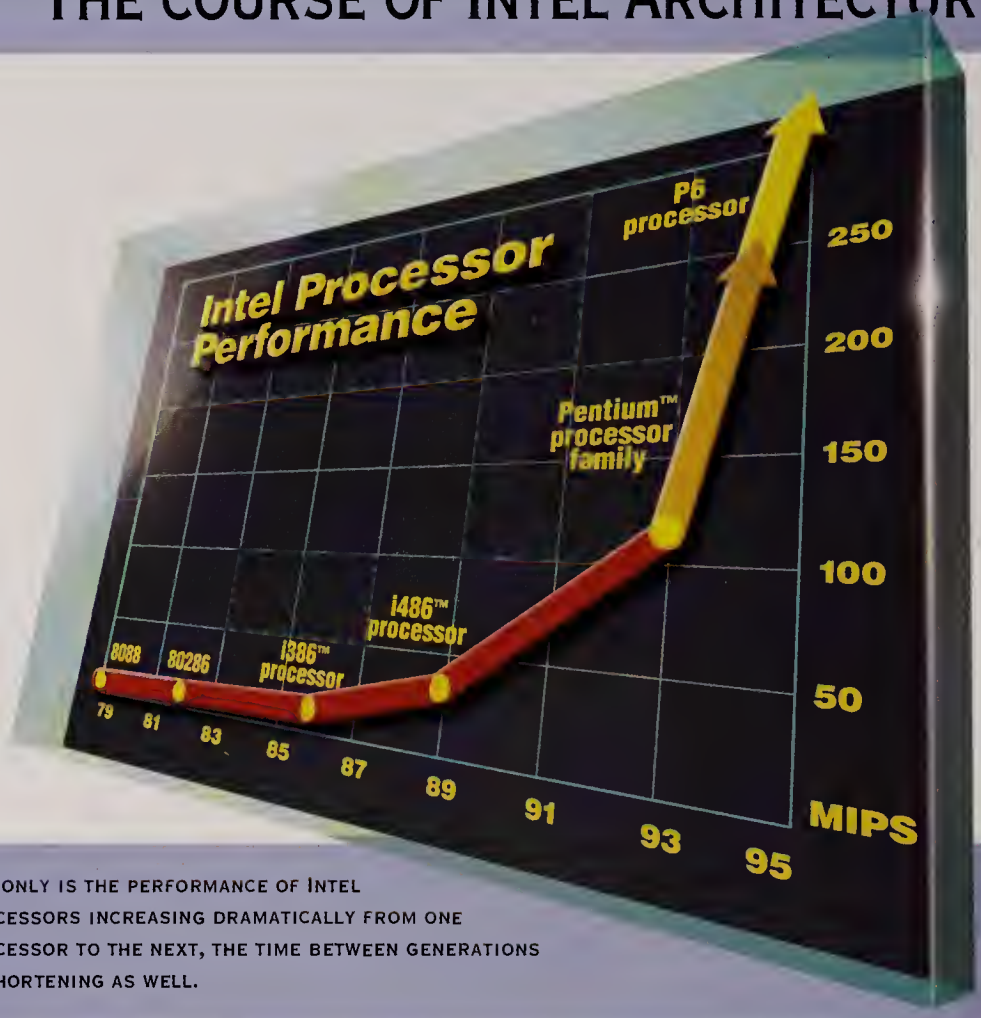

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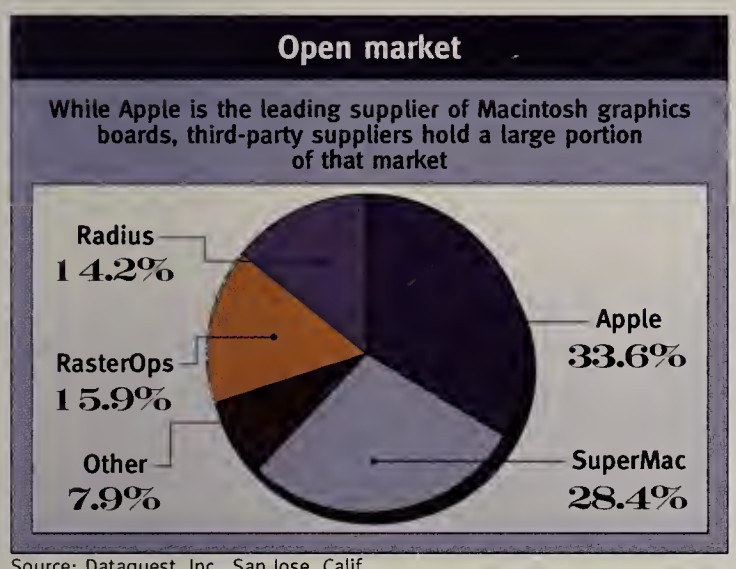
Power Mac to pick up speed

PCI bus addition will enhance graphics boards

By Mark Halper

Apple Computer, Inc.'s plans to incorporate the Peripheral Component Interconnnect (PCI) local bus in its next-generation Power Macintosh should mean more, faster and lower-priced graphics boards for Macintosh users, according to users and analysts.



Source: Dataquest, Inc., San Jose, Calif.

Those observers said the Macintosh graphics market will open up to scores of companies that make graphics products for PCs using the PCI bus. Currently only four companies, including Apple, supply most of the graphics boards for the Macintosh, which uses Apple's slower NuBus to accommodate those boards.

"It's going to give [users] access to a lot wider range of products, and when you have a lot of competition, it drives down the prices," observed Linley Gwennap, editor of "Microprocessor Report" in Sebastopol, Calif.

The pending arrival of PC graphics suppliers in the Macintosh camp recently galvanized the merger plans of two Macintosh rivals — Radius, Inc. in San Jose, Calif., and SuperMac Technology, Inc. in Sunnyvale, Calif. [CW, May 30].

"We tend to live in a world of higher margins, they tend to live in a world of lower margins, and we're going to have to get more agile and quicker on our feet," a Radius spokesman said.

While lower pricing and greater choice will be a matter of economics, faster speeds will result from technology differences. The PCI bus runs at about 10 times the speed of the 10M byte/sec. NuBus, noted Jack Roberts, an analyst at Dataquest, Inc. in San Jose, Calif.

Users welcomed the idea of a faster bus.

"Anything that has to go through the bus is going to be sped up," observed Power Macintosh user Martin Zumbrunnen, systems administration director at Covey Leadership Center in Provo, Utah. Utah. "We're pushing the edge, and we want to see it grow further."

Seagate interface stirs confusion

By Jaikumar Vijayan

Seagate Technology, Inc. is trying to sign up broader support for its high-speed data-transfer interface.

The interface, called Fast AT Attachment (ATA), is an advanced implementation of the industry standard ATA interface that supports high-speed data transfer using a standard AT hardware-to-VL bus or Peripheral Component Interconnect (PCI) connection.

According to Seagate, the Fast ATA interface provides a quick and easy way for users to maximize the performance of any XT/AT bus, Extended Industry Standard Architecture, Video Electronics Standards Association logic bus or PCI system. This is done by accelerating data transfer rates up to 13.3M byte/sec. — or roughly three times faster than standard Integrated Drive Electronics (IDE) products and about 30% faster than Fast SCSI-2.

David Tang, product marketing manager at Seagate, said Fast ATA does not require special host adapters, BIOS or operating systems. Users can upgrade their systems by installing Fast ATA host adapters and Fast ATA disk drives.

"Enhanced IDE dictates that systems be overhauled and hardware adjustments be made," Tang said. "This is something that is best done by OEMs and systems integrators." Fast ATA, on the other hand, addresses a much broader range of users and can be implemented with minimal tweaking of hardware or software, he said.

However, Seagate's attempt to position Fast ATA as an alternative to enhanced IDE creates some ambiguity in the industry over a correct definition of the two standards, observers said.

Alexa McCloughan, an analyst at International Data Corp. in Framingham, Mass., said Fast ATA constitutes only one component of enhanced IDE.

"Fast ATA extends the useful life and potential benefits of AT-attached devices and makes them more robust," McCloughan said, but it does not replace enhanced IDE as a broad interface standard.

Gary Marks, vice president of marketing at Western Digital Corp.'s storage products division — a prime mover of the enhanced IDE standard — agreed. Seagate's ATA specification addresses only the issue of data transfer and is similar to the fast transfer feature in enhanced IDE, he maintained.

Unintended consequence

While Seagate says it is not seeking direct comparision with enhanced IDE or other standards such as Fast SCSI-2, its recent campaign for wider acceptance of ATA is seen by some as doing just that. "By trying to compare Fast ATA and enhanced IDE, Seagate is only causing confusion in the market," Marks said.

Enhanced IDE is an attempt to address four specific and primary limitations to the existing IDE interface, Marks said. They are as follows:

- Support for drives larger than 528M bytes.
- Support for fast data transfers on the local bus.
- Support for a second connector to allow four drives.
- Support for non-hard disk peripherals, primarily CD-ROM drives.

Viruses

CONTINUED FROM PAGE 39

some sort of technology that has potential for some sort of security incident, from computers to voice mailboxes."

A strong CERT at Motorola, set up in 1991, has been able to keep up with the changing environment, Kinyon said. "Over the last three years, the number and severity of virus infections has dropped tremendously, and our response to incidents is faster and more coordinated," he said. "It was a necessary step as we moved from mainframes to distributed computing."

Rockwell International's *Micki Krause receives virus tips from a variety of CERTs*

An enormous task

Although corporate CERTs vary widely in structure and mission, most consist of a central group connected electronically to CERT representatives at remote sites.

IBM's CERT for its internal users is based in Sterling Forest, N.Y., but works with 80 IBM CERT specialists worldwide. The central group not only responds to virus attacks but also sets policy for use of IBM's 250,000 PCs and takes rigorous steps to ensure compliance across the company.

Alan Fedeli, IBM's manager of antivirus and phone fraud, said IBM is beefing up its antivirus measures. Once content to have 50% to 75% of its internal users run virus scanners on their PCs, IBM is now shooting for 90%. "It's not possible or desirable to get to 100%; that's overkill," he said.

Rockwell International Corp. has a central CERT connected to 30 business unit CERTs. Micki Krause, the company's program manager for corporate information security, said she gets alerts from CERTs at NASA, the U.S. Department of Energy, Carnegie Mellon and vendor CERTs at Sun Microsystems, Inc., Hewlett-Packard Co. and IBM. After determining their applicability for Rockwell users, she forwards relevant information by electronic mail to the 300 security officers and system administrators around the world.

Despite the help from other CERTS, the earliest warnings come from users on the Internet, Krause said. For example, she learned of the recent security hole in IBM's AIX operating system from an Internet bulletin board two weeks before the official alert came from the CERT at Carnegie Mellon [CW, June 6].

Alien patrol

Corporate computer security experts say concern about computer viruses — driven to a fever pitch in 1992 by the Michelangelo virus — has abated considerably, as has the population of active viruses, many of which have been purged by the antivirus software deployed against Michelangelo.

"But now the number is picking up again," said Alan Fedeli, manager of the IBM CERT, which handles 1,000 virus incidents a year on internal and customer machines.

The problem is that many users have grown weary of running virus scanning software, so companies are replacing that software — which, like seat belts, requires user compliance — with memory-resident antivirus programs, which are more like air bags.

At IBM, when the memory-resident software finds a virus, it immediately pops up a screen asking the user to report it by E-mail to the company's central CERT. "This gives us very close to 100% compliance," Fedeli said.

"We want our users to get off of traditional scanners," said Tim Saltmarsh, information security manager at Texas Instruments, which has 60,000 PC users. "Most of the time they run them they don't find a virus, so eventually they stop doing it."

Saltmarsh said TI will move to memory-resident software that continuously and transparently looks for viruses, notifying users when it finds one.

Experts say the traditional virus scanners are still needed for use on software before it is first loaded onto a computer.

— Gary H. Anthes

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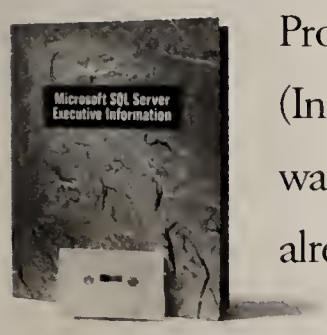

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Trio teams to create 64M-byte DRAM chip

By Jaikumar Vijayan

IBM, Siemens AG and Toshiba Corp. recently announced plans to design and develop a second-generation 64M-byte memory chip.

The new generation of dynamic RAM will build on earlier, separate efforts by the three partners to develop a 64-bit chip. The first-generation high-density chip is currently shipping in sample quantities, according to IBM.

Analysts welcomed the announcement and said with current applications driving the need for greater speed and memory, 64M-byte chips could start finding their way to market in increasing numbers by mid-1995.

"It's probably going to start with the high-end workstation market, but [DRAMs] are going to find their way into PCs," said Ron Bohn, a senior industry analyst at Dataquest, Inc. in San Jose, Calif. "There are a lot of multimedia applications and video and audio applications that will require a lot of speed and memory."

As Intel Corp.'s Pentium becomes the processor of choice on the desktop, increasing memory requirements will spur the market for DRAM chips, he predicted.

Under the terms of the alliance, the companies will design and develop memory chips at IBM's facilities in East Fishkill, N.Y., and Essex Junction, Vt. The new DRAM chips, which will provide smaller footprints for high-density memory applications, should start appearing by mid-1995, according to Toshiba.

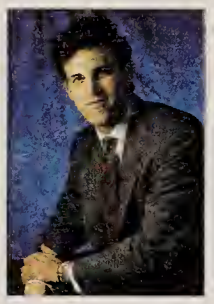
"This project is for the development of samples only; therefore, it will not go in for volume production," said Kenjiro Ishihara, a vice president and general manager at Toshiba.

Toshiba, which started developing a 64M-byte DRAM prototype in 1991, hopes to make samples available by September, he said.

Commentary

Michael Fitzgerald

Hot stuff



Is it real or imaginary? The swirling realms of the computer industry generate as much rumorware as vaporware. Some of the more interesting (dare I say truthful) tidbits follow.

Not to trot

The hottest products you won't see this year are PCs based on Intel's DX4/120. The chip, a screamer that runs at 66 MHz outside and 120 MHz inside a system, has been shown to some most-favored corporate users who thought its speed was tremendous. But one source who tested a system with a DX4/120 said his vendor recently suggested he stop salivating because it wasn't going to appear.

Nano notebooks coming

The subnotebook market is heating up as users take to the light weight of these products. Early player Zenith Data Systems will add to its Z-Lite family sometime around July with a 4.3-pound Z-lite that offers a color screen and a 200M-byte hard drive for less than $2,000, according to sources. The screen will be single-scan, passive-matrix color.

What will they think of next?

Vendors are figuring out all sorts of ways to stuff technology into the tiny PCMCIA form-factor. Socket Communications, for instance, will release a mobile global positioning system this month on a single PCMCIA card. Later in the year, it will release a PageCard alphanumeric pager and a combination Ethernet/fax/data modem card, according to sources.

Fitzgerald is *Computerworld*'s senior editor, mobile computing.

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New Products

Aztech Labs, Inc. has announced Explorer, a multimedia upgrade system, and two sound cards, Sound Galaxy Orion 16 and Nova 16 Extra.

According to the Fremont, Calif., company, Explorer includes a built-in wave table synthesis for lifelike musical instrument sounds, a plug-and-play interface card and a CD-ROM drive.

Explorer supports 16 musical instrument digital interface channels and 32 voices or 32 polyphony notes. It also contains 2M bytes of compressed sound in read-only memory.

The Sound Galaxy Orion 16 sound card is upgradable to both an FM tuner and a SCSI II card. Nova 16 Extra features 16 multimedia and business audio software programs.

Both sound cards come bundled with speech-recognition software and Macro-Media, Inc.'s Action 3.0 software.

Explorer costs $499, Sound Galaxy Orion 16 costs $169, and Nova 16 Extra costs $159.

▶ *Aztech Labs*
(510) 623-8988

AcuPrint, Inc. has announced SecureCheck4+, a modular I/O hardware card/software subsystem for Hewlett-Packard Co.'s LaserJet printers.

According to the Carlsbad, Calif., company, SecureCheck4+ lets companies print checks on LaserJet printers using blank check stock. It also offers magnetic ink character recognition from a variety of host machines.

The product supports remote printing, works with numerous accounting packages and features multiple levels of security, plug-and-play capability, signature logic, micro-encryption and document sourcing.

Prices start at $1,350.

▶ *AcuPrint*
(619) 929-4808

MediaMagic has announced the MediaMagic Sound Card, a sound card for PCMCIA-equipped computers that improves the quality of sound reproduction on laptops and notebooks.

According to the Austin, Texas, company, the card lets users play stereo music and sound files and record stereo input from a microphone.

The card can synthesize the sounds of up to 18 instruments and provides an interface for microphone input as well as a stereo line connection for tapes, CDs and other audio sources.

The MediaMagic Sound Card costs $399.

▶ *MediaMagic*
(512) 339-3500

FutureTech Systems, Inc. has introduced the FutureMate Notebook Series of Intel Corp.-based I486 100-MHz DX4 notebook PCs.

According to the Hackensack, N.J., firm, FutureMate features sound and audio playback, a user-programmable processor design, 36M bytes of expandable memory and dual batteries with a hot-swap function that enables battery changes while the system is on.

FutureMate comes standard with serial, parallel, external keyboard and external VGA monitor ports, as well as a built-in trackball pointing device.

FutureMate notebooks cost from $2,629 to $3,595.

▶ *FutureTech Systems*
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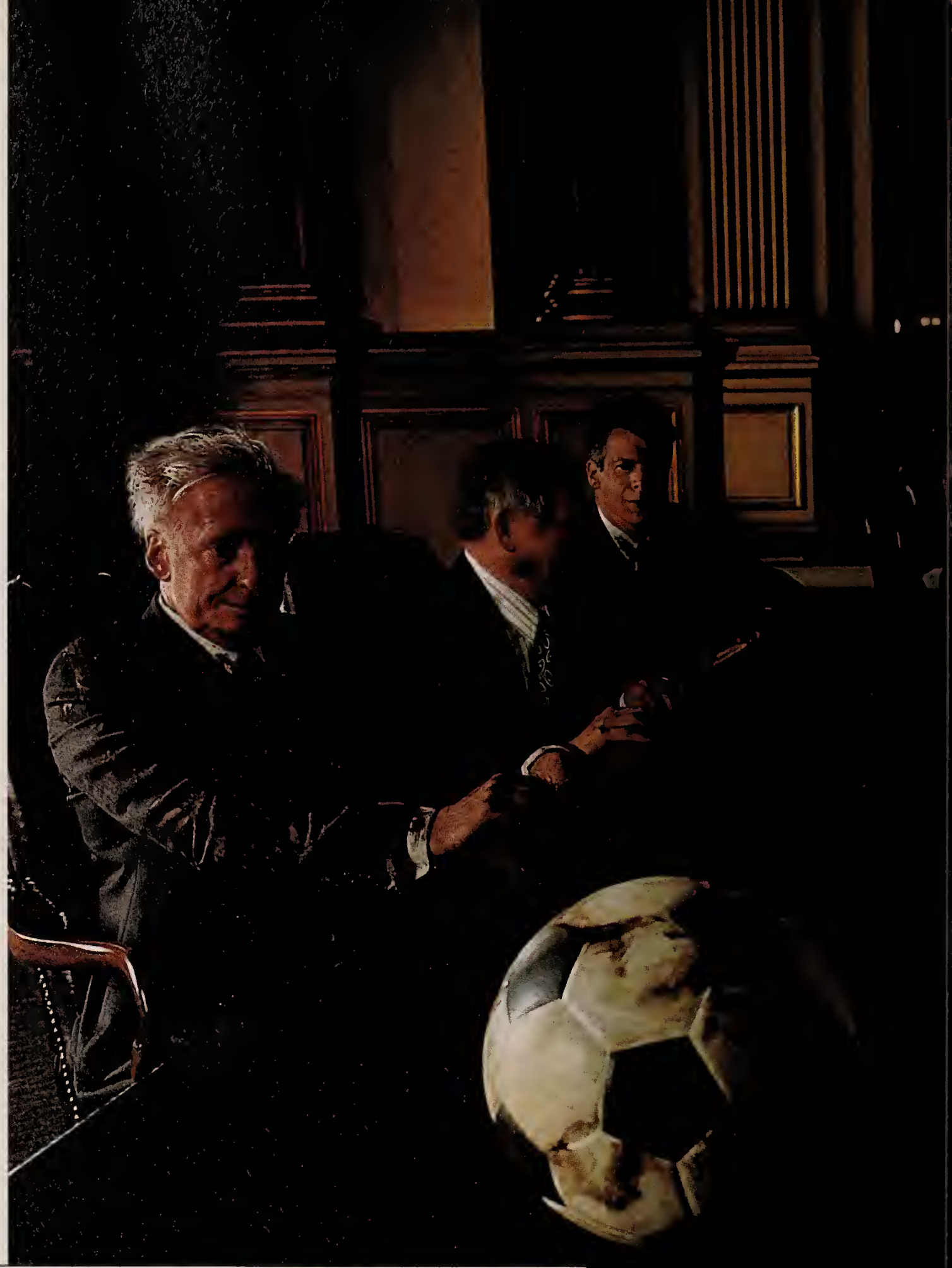

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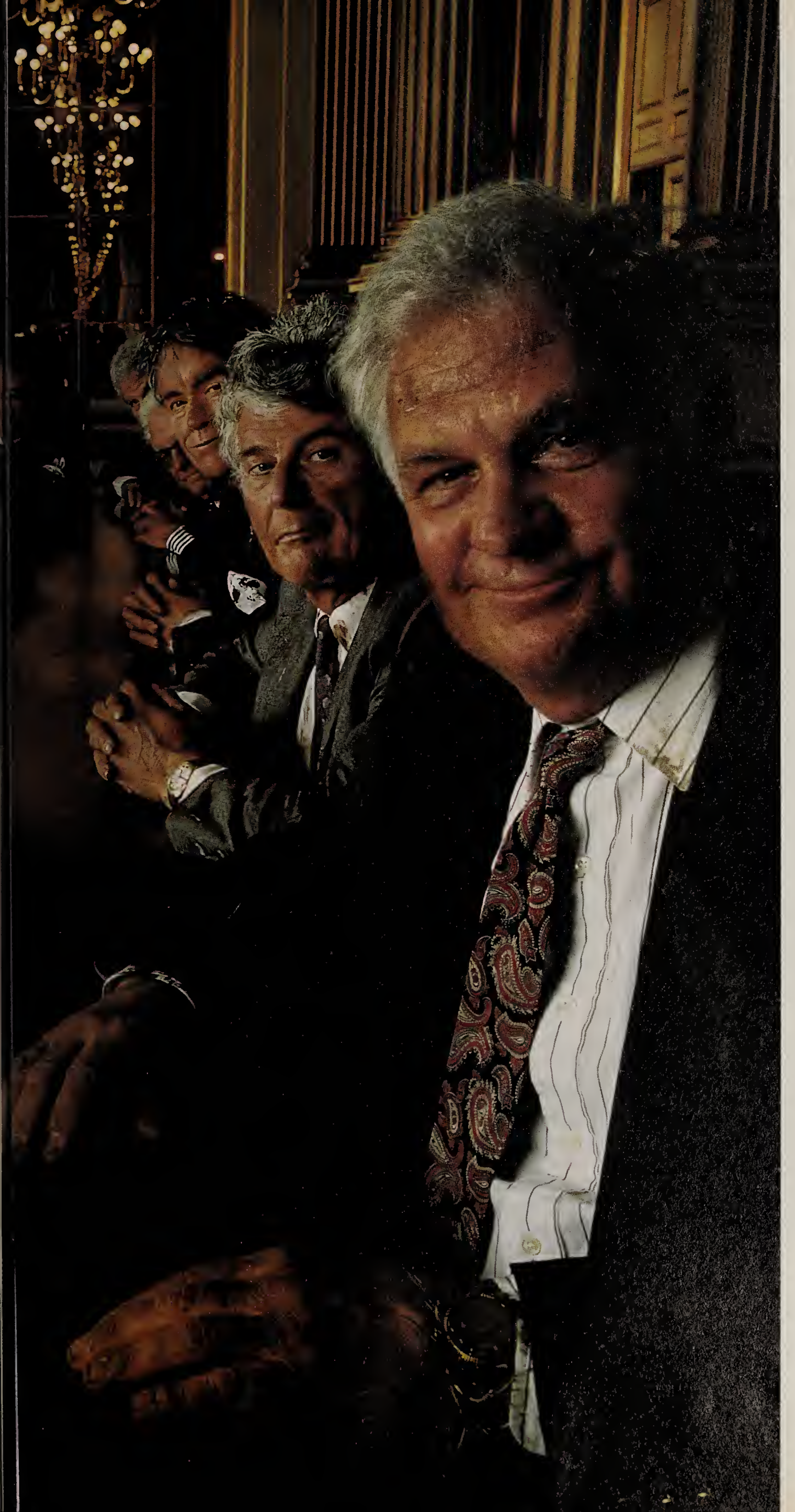

field operations for 24 World Cup teams in four different time zones. The entire business operation of the World Cup games—more than $1 billion—will be run on Sun computing. ◈ And remarkably, the entire network was installed in less than four months. ◈ Which may be why, as the World Cup games are kicked across America, a few eyes may also be on the computer system that was judged simple enough to manage, yet powerful enough to run the world's largest sporting event. ◈ More than 135,000 businesses are using Sun systems, powered by the SPARC® chip and the Solaris operating environment, to gain a competitive advantage. The World Cup is just one. To learn more, call 1-800-426-5321, ext. 755. Or, on the Internet, access Sun's World Wide Web server at http://www.sun.com/

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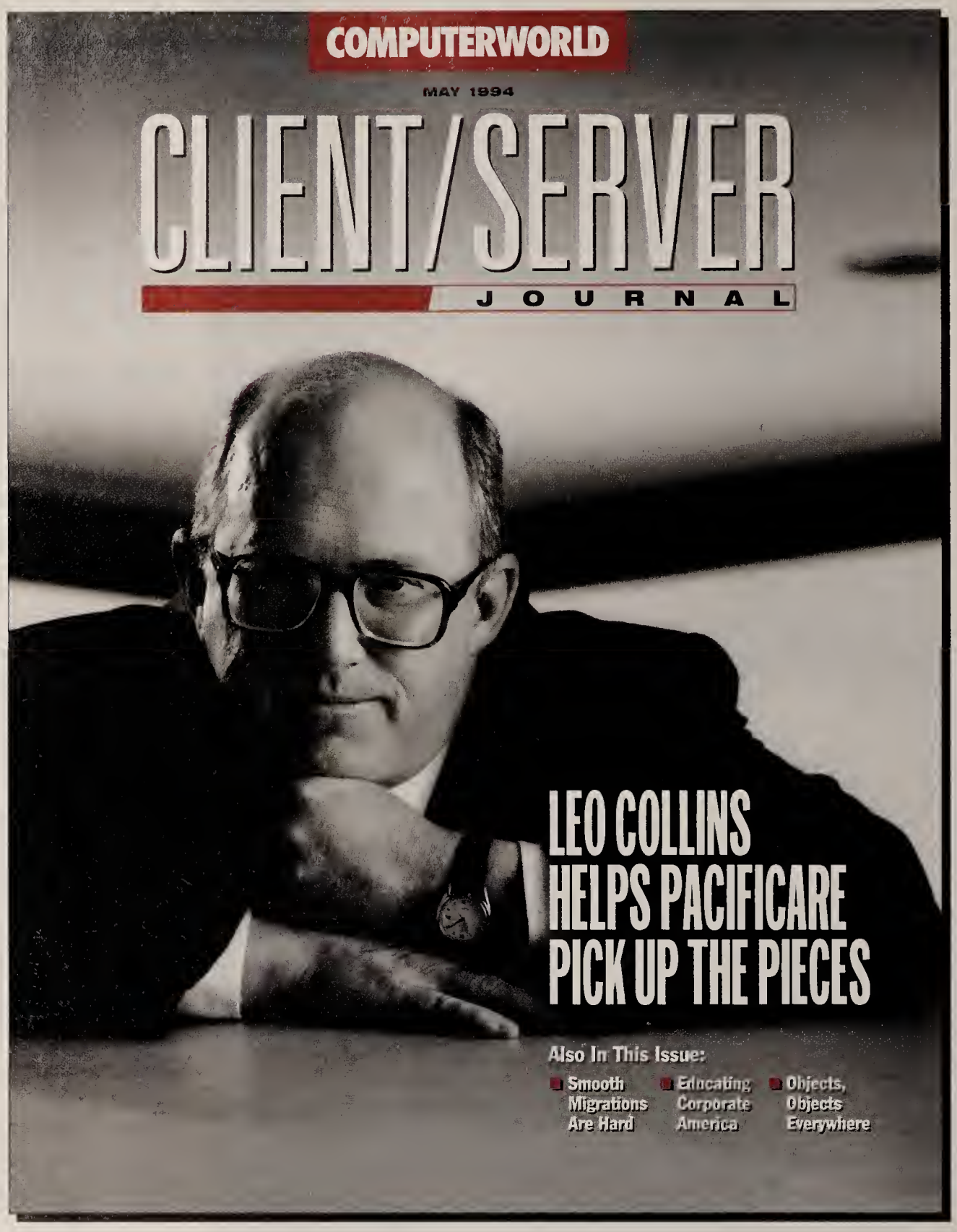

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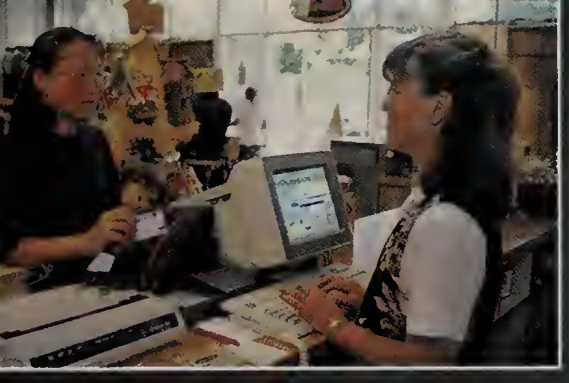
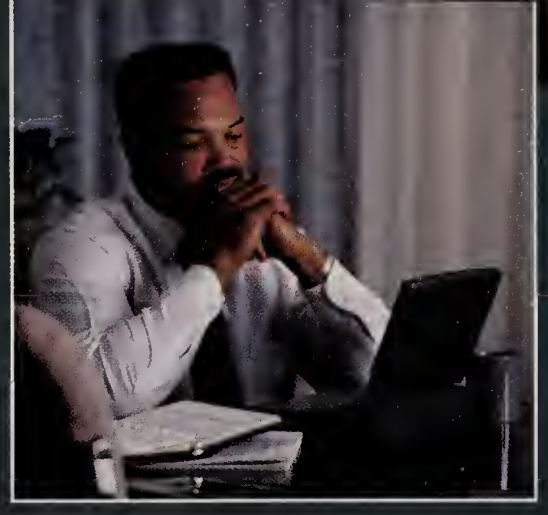
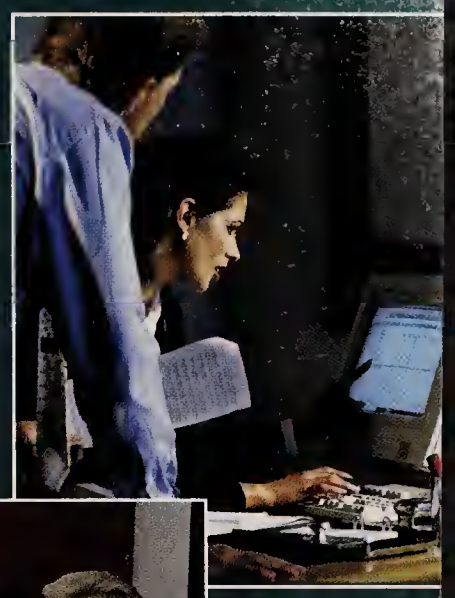
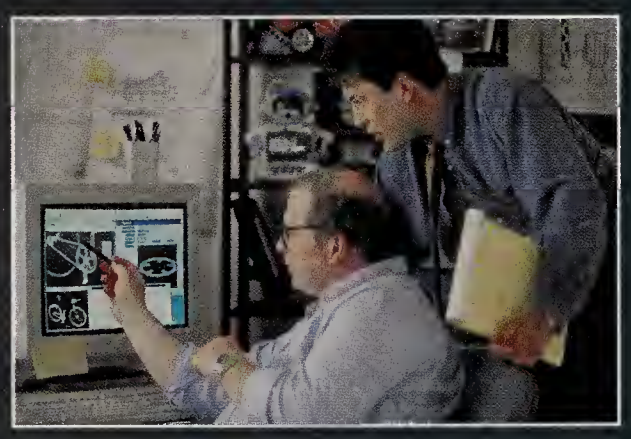






Computing Strategies to Maximize Competitive Advantage



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Three Steps to Business Computing Success

WHAT'S INSIDE

Businesses large and small need to use information technology effectively to compete in the 1990s environment of narrow margins and constantly changing market conditions. The Microsoft Solution Provider Program (p. 20) teams independent organizations with Microsoft to help businesses build computing solutions with the Microsoft Solutions Platform of products (p. 18). Businesses such as insurance agencies and law firms need targeted solutions to face their particular problem sets (p. 13). So, too, do other vertical markets and applications. See the following pages for specific examples:

- Banking 3
- Health Care 6
- Sales Automation 12
- Insurance/Legal 13
- Manufacturing 14
- Retail 15
- Document Management 18
- Accounting 19-20

In the 1980s, the computing industry was still in its relative infancy — and simpler. There were fewer vendors, and in many cases a single, major vendor could supply a company with everything — computers, printers, peripherals and software — plus install, service and support it after the sale.

In the 1990s, things changed. Open architecture made computer systems flexible and, along with price competition, began to make possible a huge array of new products and suppliers. The upside? Today you enjoy more choices and lower prices. The downside? It's more difficult to evaluate and decide among those choices.

How can you integrate information technology into your organization's strategic direction, and keep your company moving in the smartest and most cost-effective technological directions? How do you navigate the maze of platforms, vendors and environments? How can you leverage technology not only for traditional uses, like information retrieval and analysis, but also for functions that may be mission-critical to your industry, such as communications, manufacturing, process control, purchasing and financial management?

Most important, how will your company realize the benefits promised by information technology — benefits such as increased revenue, and enhanced productivity and customer service?

Step No. 1 in developing sueh a business computing strategy is identifying what problems your organization and your industry face. If your business is product-based, how can you shorten time to market and bolster your sales staff's productivity? If your business is service-based, how can you improve customer response time and satisfaction? Are there ways you can streamline communications and business processes?

Step No. 2 is identifying the available software, hardware and communications systems that will help you address your specific business needs. Many successful businesses are implementing their strategies by building on the Microsoft® Solutions Platform, a complete and available set of desktop and server applications, development tools, graphical programming systems, operating systems, database servers, and products for connectivity, messaging and systems management.

Step No. 3 — designing and implementing your technology solution — calls for rallying both in-house support staff and external experts, including consultants, trainers, developers, value-added resellers, systems integrators, and resellers. Taking advantage of outside experts gives you the best possible resources for speedy implementation and lets you use shrinking internal resources selectively.

Rallying external support

Outside support is readily available in the virtual army of third-party organizations worldwide that can analyze your firm's information technology situation, develop or review a strategy, implement solutions, troubleshoot problems, and help users get up to speed. These experts operate in a broad range of industries and across all computing environments. Microsoft initiated the Microsoft Solution Provider program to create partnerships with more than 5,000 organizations that offer multivendor business solutions and services to Microsoft customers worldwide.

Many innovative companies, such as QuickStart Technologies, Inc., based in Newport Beach, Calif., have built their businesses by helping organizations deploy solutions with Microsoft products. QuickStart's product line, known as Techceleration℠, provides accelerated learning for technical professionals on Microsoft technology.

Thousands of third-party organizations are helping customers implement solutions based on Microsoft products such as Microsoft Windows NT, released a year ago. In many of the stories that follow, industry- and company-specific problems are being solved with solutions powered by Microsoft Windows NT, Windows NT Advanced Server, Microsoft SQL Server™, the Microsoft Office and Microsoft development tools sueh as the Microsoft Access® database management system and Microsoft Visual C++™ development system.

Business computing in the '90s requires a well-thought-out strategy, open best-of-breed products and knowledgeable support that is there when you need it. When all are in place, the increased revenue and productivity benefits follow directly.

For more information on QuickStart, call (714) 476-7575.

The Challenge: showing one face to the customer while integrating systems with external support organizations.

Bank of Boston's Steve Eastburn chose BancWare's Convergence to support more than 60 of the bank's units worldwide. The system has improved planning by standardizing uncommon processes and allowing greater access to and understanding of forecast assumptions.

BANKING

Banking Systems Deliver Improved Responsiveness

Banking in the 1990s shows a rapidly changing world, where shakeout survivors have achieved economies of scale with lower cost structures and increased returns. The pressure on banks comes from many angles, including a declining volume of bank loans over the last decade and competition from new vehicles offering funding alternatives that may be faster, more flexible, or more available than traditional business loans.

In response, banks are working harder to attract new customers and retain current ones. Many of them have too much capacity and too few customers. As they outsource products and services to third-party organizations for processing, they discover they need an information technology system that can integrate with those external support organizations, yet show one face to the customer.

Also, commercial bankers themselves are under pressure to reduce costs and loan approval times while improving risk management, service and productivity. While they need to find a way to do more with less, they're often impeded by inefficient workflow, inflexible computer systems, and a lack of front- and back-office reconciliation.

Top priority: customer relations

Many established banks that share these dilemmas, and especially need to focus on customer relations, have turned to BancA/Andersen in Dallas for a client-server-based workbench set of tools called Solutions for Commercial Banking (SCB). SCB is a product relationship between Microsoft Corp., BancA Enterprise and Andersen Consulting, based in Chicago, to foster connectivity and capability between Microsoft® products and banking software applications.

"Seventy percent of the gain from reengineering banking processes comes from new technology," says John Humphrey, director of solution engineering at BancA. "Banks can say, 'We want our loan officers to write more loans,' but if officers are still writing on yellow pads and secretaries are typing up their notes, the banks won't see the results they'd see if the officers had laptops and fast access to data," says Humphrey.

Bank analysts will be able to query Microsoft SQL Server™ relational databases powered by the Windows NT™ operating system for loan histories and real-time data, and then download it for manipulation and analysis in Microsoft Excel. Using Microsoft Word and BancA's POWER 1® automated banking application, they can generate proposals and reports that contain the Microsoft Excel data and charts. Everything can then be imported to Microsoft PowerPoint® for on-site or remote presentations to current and prospective clients.

The SCB tools workbench also includes POWER 1 modules that help commercial officers automate their marketing, loan origination, and customer review administration tasks.

Standardization delivered

A different problem sent Bank of Boston Corp. to BancWare Inc., a Microsoft Solution Provider based in Braintree, Mass. The $41 billion-asset bank holding company wanted to standardize the way its 60 unit managers prepared budgets and forecasts so that everyone used the same models and tools, met the same planning requirements, and delivered data that was consistent and easy to consolidate.

Bank of Boston chose BancWare Convergence — an object-oriented integrated financial management system that uses the Microsoft Windows™ operating system and the Microsoft Excel spreadsheet for data import and analysis — as its software solution.

With the new system, figures are consistently presented and calculated, and consistency has improved the credibility of consolidated numbers, says Al Reese, director of management reporting at Bank of Boston.

The BancWare system helps managers look at profitability dynamics differently, identify profit opportunities, and confront problems before they become crises.

For more information, call John Humphrey, BancA, at (214) 761-8136 or BancWare at (617) 848-5800.

When a few engineers at Microsoft set out to write Windows NT™, they sat down with many cups of coffee, and computers built around the MIPS® R4400™ RISC microprocessor.

(No wonder: the NEC V_R4400™ MIPS processor is at the heart of some of the most powerful computers in the world.)

During the next few years, they worked long and hard, missing quite a few dinners with their families and untold televised sporting events.

Today, Windows NT makes it possible for companies to run their enterprise software on a whole new class of dependable, affordable machines. Like the NEC Express RISCserver™, direct descendant of the machines used to write NT itself. And it gives software developers, designers and engineers access to remarkable new tools like the NEC Image™ RISCstation™.

In short, a few engineers sat down. And the entire computing world leaped.

The only Windows NT-specific systems in the industry: NEC MIPS RISC Systems

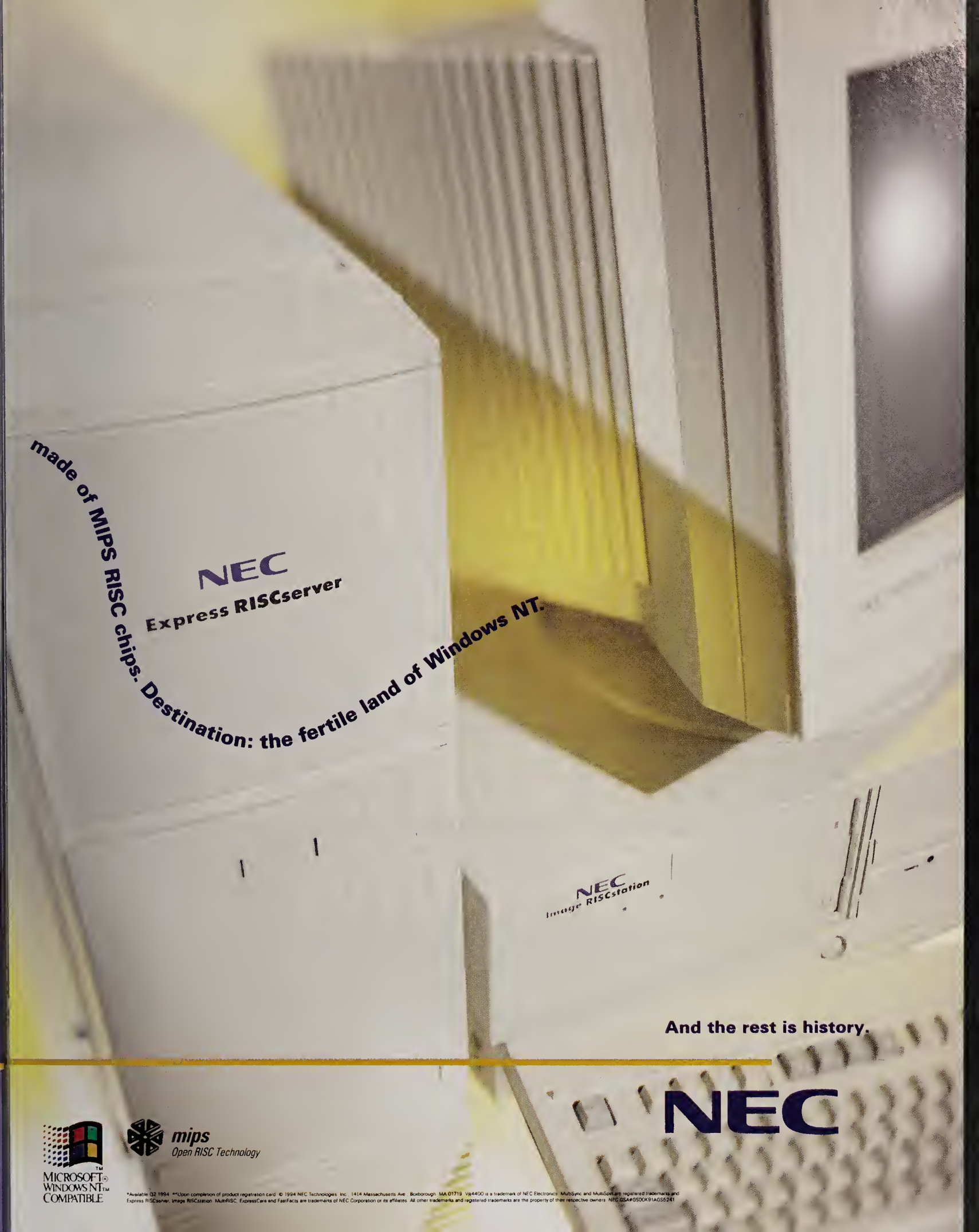
- **Express RISCserver**
- **Image RISCstation**

for the new generation of 32-bit client/server and database applications

- *NEC V_R4400™ MIPS RISC processors with MultiRISC™ architecture supporting dual processor SMP operation.*
- *MultiRISC system management for hardware problem detection and reporting (standard on RISCserver)*
- *Fully optimized multithreading among four hardware subsystems: I/O, processor, video and memory*
- *Up to 128MB RAM on the system board; additional memory expansion up to 512MB (ECC coding) using industry-standard SIMMs*
- *MultiSpin® 3Xi CD-ROM standard on all NEC RISC Systems**
- *Hard drive options up to 2.0GB*
- *Fault-tolerant "hot-swap" RAID option (RISCserver)*
- *3-year limited ExpressCare™ warranty;** ExpressCare upgrade options available*

A river of coffee. A raft

For more information, call 1-800-NEC-INFO or, for details via fax, call NEC FastFacts™ at 1-800-366-0476, #46474721 Image RISCstation; #97774721 Express RISCserver.



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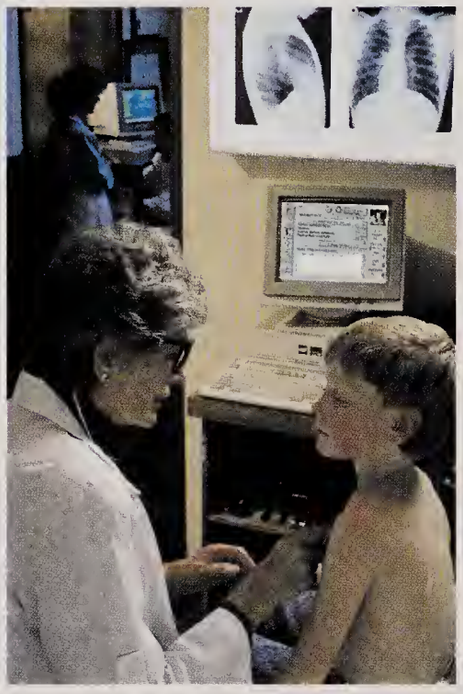
HEALTH CARE

Health Care Reform Gets a Shot in the Arm



Using a pen computing device tied to a computerized medical records system, clinicians can record physical exam results that are updated in real time.

Health care reform is bringing major challenges to health care providers across the country, and many technology-related issues continue to surface as the debate rolls on.

For example, the trend toward consolidation results in the need to integrate dissimilar computing systems. There is also a movement toward increased outpatient care, which necessitates systems that can scale from standalone, easy-to-use, hand-held units for clinicians to community health care information systems that serve as clinical repositories for communities or regions.

As costs climb and medical knowledge continues to explode, health care organizations are finding it increasingly difficult to influence, monitor or predict expenditures. Changing business conditions and increased competition make it critical that health care systems be built as quickly as possible to enable efficient processes. Many health care organizations are reengineering their systems and eliminating obsolete functions as they search for ways to streamline other functions.

Win^2 Technologies, Inc. in San Bernardino, Calif., offers health care organizations an information technology solution that addresses many of these pressing issues.

WinCare™ offers a comprehensive practice management and computerized medical record system. Doctors in both small rural practices and large regional networks can use the scalable system to get information about clinical protocols they should follow to deliver consistent health care. During a patient visit, the health care provider can download information as well as input patient financial and clinical information.

Tools like WinCare™ give doctors quick access to patients' medical records.

Organizations accomplish this by connecting a complex web of legacy health care systems with new information technology. WinCare gets the job done through extensive use of the Microsoft Solutions Platform of products. On the back end, it uses the Windows NT™ operating system, Windows NT™ Advanced Server, and Mierosoft SQL Server™. On the front end, it uses Microsoft Windows™ for Workgroups operating system with integrated networking, the Microsoft Aecess® database management system and Microsoft Mail.

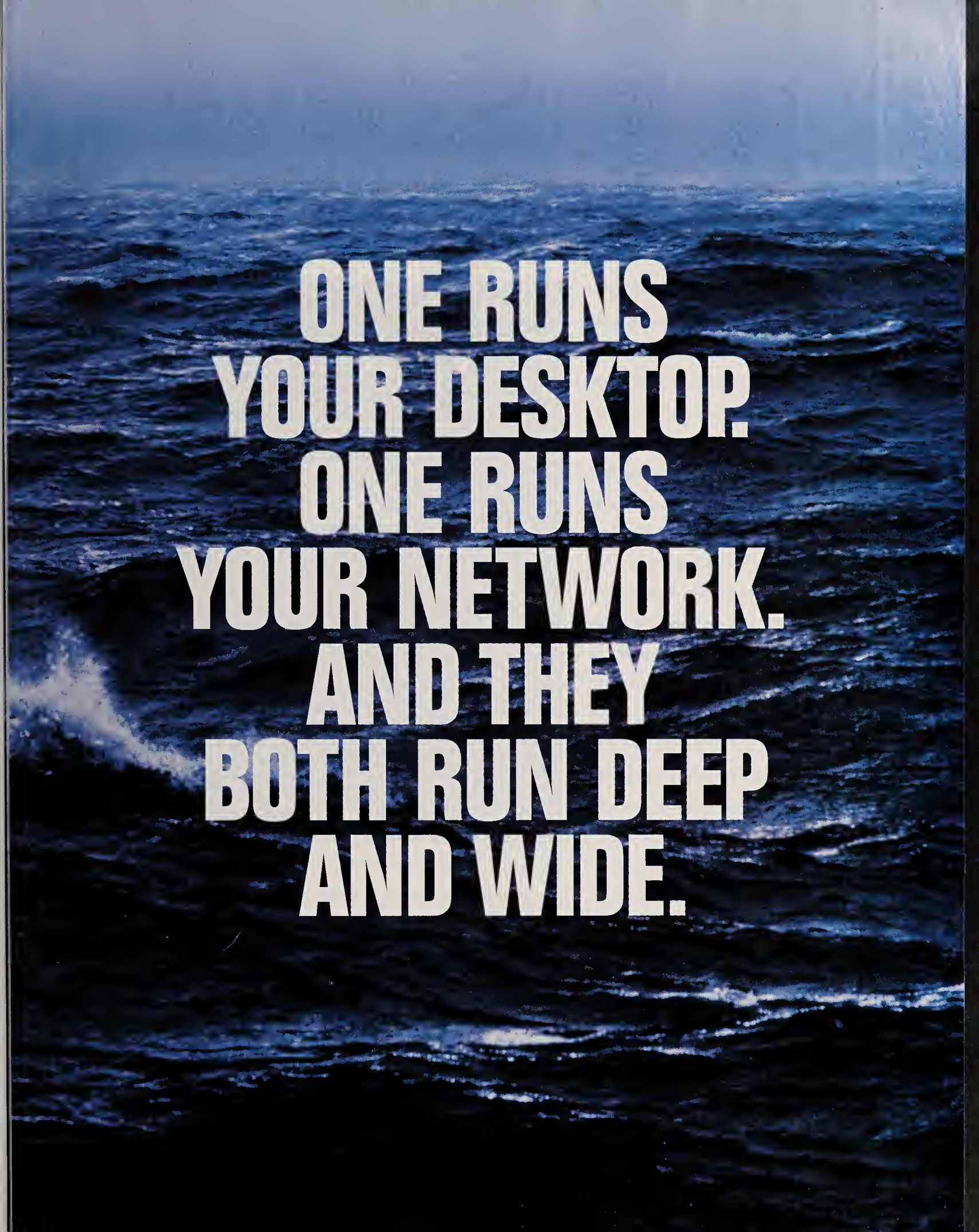
Here's how it works: With an easy-to-use pen computing device, a clinician uses WinCare to download a patient's medical record from a database residing on a server. The clinician records observations and physical examination results with the click of the pen and the records are updated in real time. The clinician can also sketch or videotape the patient, write prescriptions, and order lab tests or X-rays right from a notebook computer, navigating easily through options via the Windows™ interface.

During the same visit, the clinician can access and consult protocols, textbooks, or the latest medical literature, or send a patient record to a colleague via a Microsoft Mail message. In addition, the clinician or an assistant can use the WinCare billing, appointment scheduling, reporting, medical record and pharmacy modules to streamline administrative duties. Because WinCare integrates graphics, sound and video, health care providers can use the system to educate patients or consult with other physicians in remote sites. They can request contextually sensitive data when they need it, wherever they need it, the way they want to see it. Health care is an information-based service industry, so the benefits from introducing new information technology are many for both providers and consumers. They include the following:

- Lowering administrative and management overhead
- Quick access to a patient's insurance coverages and restrictions
- Avoiding unnecessary and duplicate test ordering
- Easy, accurate monitoring of drug usage
- Better outcomes analysis, and
- Improved patient education.

Information technology is a boon to health care organizations that are reexamining and reengineering their processes during this era of health care reform. And client-server systems are the key to bridging the old with the new.

For more information, call Win^2 Technologies at (909) 383-3500.


ONE RUNS
YOUR DESKTOP.
ONE RUNS
YOUR NETWORK.
AND THEY
BOTH RUN DEEP
AND WIDE.

WINDOWS NT WORKST
JUST BELOW

There's a vast expanse of challenges out there. And you have to solve them from one workstation.

Whether you need to run elaborate manufacturing or engineering applications, financial, architectural, development or other sophisticated applications, you've got to get those complex jobs done more efficiently. More easily.

And without the right operating system running underneath those advanced applications, you're dead in the water.

That's the reason Microsoft® Windows NT™ Workstation operating system is so significant. This 32-bit system gives you high-end workstation power along with the productivity, ease and compatibility of the Windows™ environment.

All for the cost of a PC.

Quicker analysis. Faster decisions.

Our preemptive multitasking lets you simultaneously run two, three, or as many applications as you want. You can seamlessly integrate your favorite productivity

programs with your more complex business-critical applications to create complete business solutions. All on one desktop.

Virtually crash-proof protection.

If one application has problems, this system keeps the others running. Unaffected. And important files and programs are secure from tampering and user error.

The simplicity of Windows.

Now you've got UNIX® power and flexibility without the arcane commands. Because Windows NT Workstation does it all in the Windows environment. It's easy to use and quick to learn. (And a big savings on training costs.)

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Use your network. Your hardware.

NetWare.® Banyan® VINES.® UNIX. TCP/IP. And Windows NT™ Server. The most popular networks in use today all work with Windows NT Workstation.

Hardware? It's your choice. From the machines you have to the ones you dream about – Pentium,™ Intel® 386/486, PowerPC,™ MIPS,® DEC® Alpha AXP.™ And more.

Consequently, this system is making waves everywhere.

Four of the top New York brokerage houses have chosen Windows NT Workstation. In a big way. As have numerous banks, airlines, factories and government agencies. Large and small.

There's a lot of solutions available for Windows NT Workstation. New versions of Microsoft Visual C++™ development system and Microsoft Office for Windows NT, with 32-bit Microsoft Excel and Word, are around the corner.

So it's time to get started. Time for you to migrate to Windows NT Workstation. Call (800) 434-3982, Dept. P6V, for your free in-depth evaluation guide. Get Windows NT Workstation now and we'll send you our next upgrade.* For free.

With all that power at your command, you might get a chance to come up for air once in a while.

Microsoft

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WINDOWS NT SERVER.
EVERYONE ALL THE

Your company is a kind of ecosystem. An intricate network of diverse types that all feed on information. Constantly.

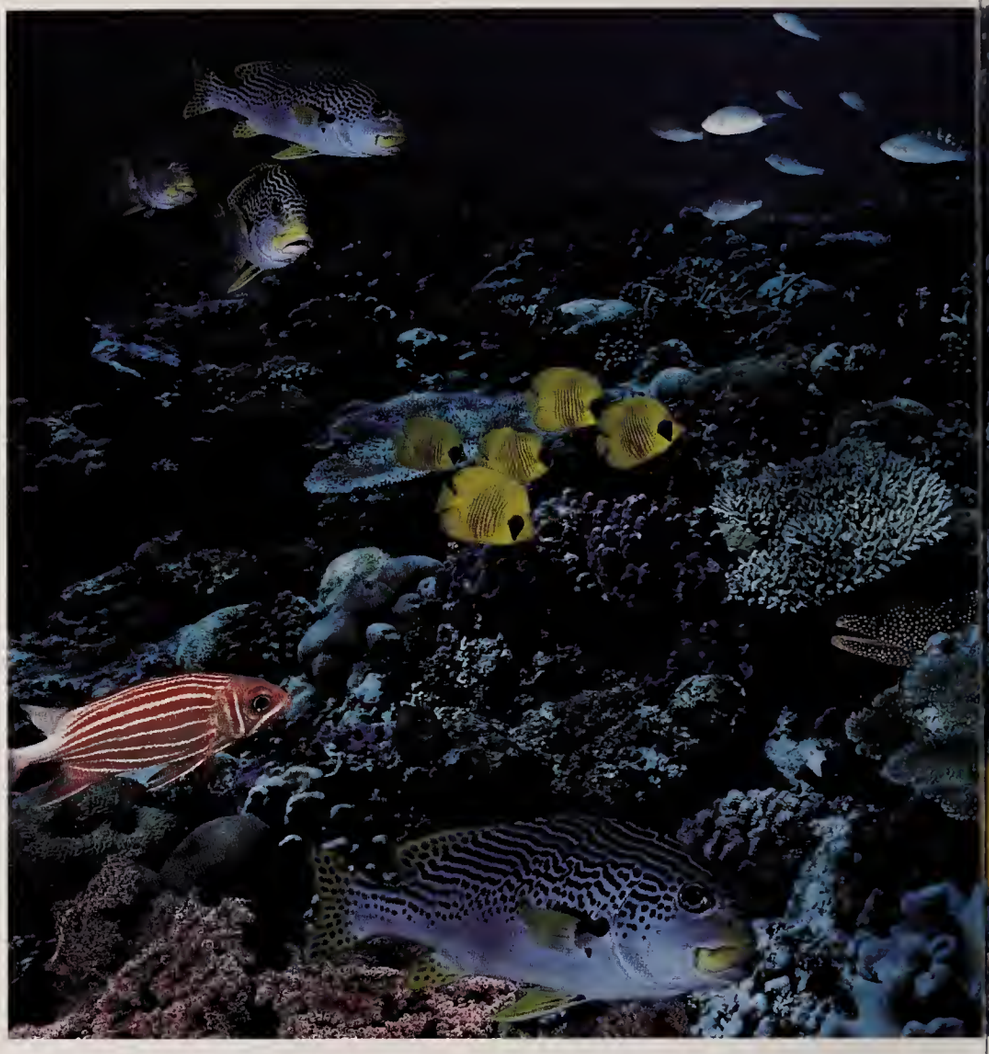
And, just as sophisticated systems in the ocean are built on a foundation of coral, your business needs a dependable platform, a solid infrastructure on which to sustain itself and cultivate growth.

The Microsoft® Windows NT™ Server is that foundation. The one complete network operating system that gives you the solution capabilities of a minicomputer with the speed and price of a file server. Nothing else can do all that.

The widest range of possibilities.

No other network operating system runs as many business programs or runs them as well. From accounting and payroll systems to customer tracking.

It supports and integrates a whole spectrum of server applications, networks and hardware. So you can find the answers to make better decisions. Faster. Through the familiar Windows™ environment.



Easy installation. Easy integration.

It's all in the box. A new standard of simplicity. Ready to set up and manage. Even with NetWare®, UNIX® and SNA systems. Because Windows NT Server integrates with all your existing networks.

Naturally, integration means you've got central management from a single computer. Load balancing. Troubleshooting. The works. All at your fingertips. Thanks to the best monitoring and management tools around.

It can even accommodate

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. ONE PLATFORM GIVES
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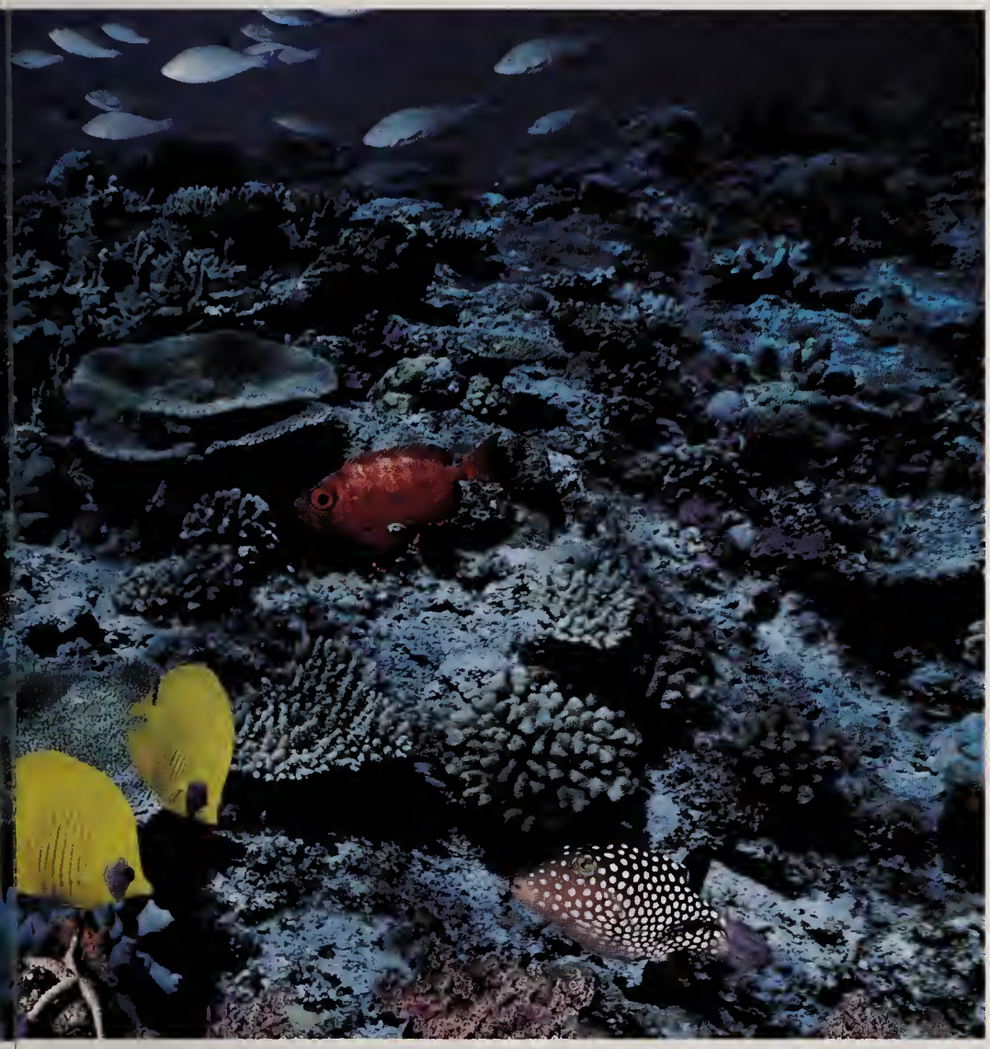

Hewlett-Packard® OpenView,® IBM® NetView® 6000, and the Sun® Net Manager.® So you can manage the largest mixed networks there are. *You pick the hardware.*

Choose the chips that deliver the best price/performance for you. Pentium,™ MIPS,® DEC® Alpha AXP.™ Single or multiprocessor.

And this platform is the essential long-term answer, too.

The microkernel achitecture at the core of Windows NT Server means the solutions you develop today will last into the next century. Our object technology, built on this core, lets you leverage your current investments as you move to new distributed systems.

That's why thousands of companies have already used it to build rock-solid solutions for their organizations. Fact is, Windows NT Server has the highest customer satisfaction rating of any Microsoft product in history.

So call us at (800) 434-3982, Dept. P6V, and get your free evaluation kit. Or get Windows NT Server now and the next upgrade* is yours for free.

Once you've got this foundation, your business might just go right to the top of the food chain.

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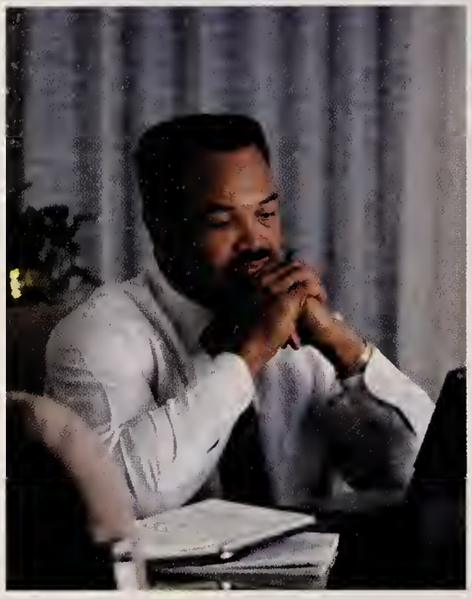


The ability to access data remotely without having to know where data resides cuts sales and marketing labor costs and improves responsiveness.

SALES AUTOMATION

Enterprise Sales Automation Speeds Data Access, Cuts Costs

In the 1990s, firms are racing to automate their sales operations to improve efficiency in an environment where customers expect better information, faster.

To set up an enterprise sales automation system that will serve them into the future, these firms must address process reengineering issues and incorporate sales, marketing and customer service into the solution.

The French pharmaceutical and chemical company Rhone Poulenc Rorer (RPR), maker of Maalox and other household name pharmaceuticals, faced a major data access problem. Its sales and marketing staff had poor or little access to corporate and third-party data that was scattered throughout the company. For example, marketing staff who requested data on dollar volume vs. market share for their monthly reports might wait from two days to two months for a response.

RPR turned to Adaptive Strategies, Inc., a Microsoft® Solution Provider based in Cherry Hill, N.J., for a technology solution that would give its corporate users and 1,500 sales representatives easy access to these different information sources. Adaptive's client-server sales force automation solution — a trio of products called SFA+, Protége, and MobileSync — is currently used in financial, manufacturing and pharmaceutical organizations. It employs the Windows NT™ Advanced Server operating system and Microsoft SQL Server™ for Windows NT on the back end and Microsoft Windows™ for Workgroups operating system with integrated networking and Microsoft Office on the front. The solution's architecture incorporates OLE (Object Linking and Embedding) automation, Microsoft Visual Basic® for Applications, ODBC (Open Database Connectivity) and message-enabled technology.

Using this solution, RPR users across the enterprise can tap into the data library from various points of view. For example, Microsoft Excel builds the query for a regional sales manager who wants to look at quarterly revenue per sales representative by territory. The data is displayed in a Microsoft Excel pivot table, and the manager can drill down into the data library for more detail and history. The next step: Create a chart, drag and drop it into a Microsoft Word document, and send the report as an attachment to a Microsoft Mail message for distribution to the regional sales staff. Sales and marketing personnel can now access data without having to know where data resides.

"We estimate that we save $1 million annually with this system," says Howard Mark, director of sales and marketing systems at RPR. "Our labor costs have gone down, and we have significantly reduced our time to market."

For more information, call Bob Land, Adaptive Strategies, at (609) 482-7886.

Windows NT and Windows NT Advanced Server

Together, the Microsoft® Windows NT™ and Microsoft Windows NT™ Advanced Server operating systems make up the most powerful platform for client-server computing. Both products are designed to be ready for the most demanding computing requirements of the 1990s and beyond.

Microsoft Windows NT for the desktop is designed to provide users with the power of a dedicated workstation while retaining the ease of use, productivity and compatibility of Windows™-based desktop systems. Microsoft Windows NT Advanced Server for the server is a high-performance server designed to support business-critical applications while also providing complete file- and print-sharing capabilities.

Microsoft Windows NT 3.1 features include:
32-bit processing, scalability, pre-emptive multitasking, support for thousands of Windows- and MS-DOS®-based applications, symmetric multiprocessing, ability to run on Intel®, MIPS® or Digital Alpha AXP™ RISC CPUs, support for OS/2® character-based applications, POSIX application compliance, built-in networking and workgroup capabilities. In addition, Windows NT 3.1 is designed for C-2 level security.

Windows NT Advanced Server 3.1 features include all of the above, plus:
Ability to run business-critical server applications such as database, messaging, and systems management services, advanced fault tolerance, centralized management, multiserver administration facilities, single network logon, remote access service with support for direct, X.25 and ISDN links, Macintosh® services for file and printer sharing, full centralized security control and access to applications running on Windows NT Advanced Server without additional software for Novell® clients.

INSURANCE/LEGAL

IT Helps Level Playing Field for Small Business

Small businesses face many of the same challenges as their larger corporate counterparts, but without the same revenue-generating possibilities. As a result, anything that increases productivity or reduces costs without sacrificing product or service quality is a boon.

That's why small businesses in nearly every field are turning to information technology to stay competitive. They've seen that properly applied automation increases productivity and efficiency and reduces costs to clients.

Young & Perry Insurance in Bridgewater, N.J., needed to increase the productivity of its independent agents so that the office could find and retain commercial business without growing beyond its current size of 24 employees. In addition, they hoped to control the paper chase that was burying agents and support staff alike.

Independent agents get boost

The firm turned to Agency Management Services, Inc. (AMS) of Norwell, Mass., which serves more than half of the country's 43,000 independent insurance agencies. AMS recommended that Young & Perry enhance its basic functions — selling, marketing, servicing and managing — via information technology. AMS's Pathfinder Plus for the Windows™ operating system integrates these four processes, allowing an agency to deploy new technology intelligently and focus its energy and investment in highly leverageable areas. Each core-function module is integrated with Microsoft® Office applications, so that underwriting, rating, and other data can be imported easily into reports, analyses, and memos.

When Pathfinder Plus for Windows was installed in his office, partner Bill Young says he saw a very positive response from his agents. In addition to using Microsoft Word extensively on their desktops for correspondence and newsletters, agents on the road use laptops and the Microsoft PowerPoint® presentation graphics software to create professional-looking presentations and documents for clients and prospects.

Young & Perry agents use the system to coordinate direct mail and telemarketing efforts, to create graphical maps for customer prospecting, and to rate personal and commercial lines. They can incorporate risk surveys into submissions and proposals, and they can easily access policy histories and client notes. Scheduling, accounting and reporting tools are also integrated into the core processes with the new system.

The information technology solution that Young & Perry implemented allowed them to reduce labor costs by more than $100,000 annually. It also allowed them to convert some support positions into sales positions, thereby increasing revenue opportunities.

Similar productivity increases and information technology "transformations" can be seen in the legal profession, where nearly 75 percent of law firms are composed of five or fewer people.

Attorneys from small firms often find themselves in court facing lawyers from large firms that can afford to maintain huge law libraries and a stable of law associates and paralegals. How can they overcome this David-and-Goliath disadvantage? By using their PCs and on-line research such as the LEXIS®/NEXIS® services to gain fast access to the same source materials as the large firms.

Access to major league tools

The LEXIS service, introduced in the early 1970s, is provided by Mead Data Central, based in Dayton, Ohio. LEXIS is a computer-assisted legal research service that contains massive archives, federal and state case law and statutes, regulations, 45 specialized legal libraries, and an extensive collection of public records. NEXIS is a news and business information service that includes a news library with 2,300 full-text sources and 2,000 sources of abstracts segmented by market and industry.

Working on their legal briefs with Microsoft Office applications such as Microsoft Word, users can directly access the LEXIS service, check legal citations, look at the full text of cases cited, and locate other memoranda in the firm's briefs bank that may pertain to their case. Without leaving Word, they can download on-line information into their legal briefs and cut and paste materials from Microsoft Excel or other Word documents. They can also send briefs via Microsoft Mail to other attorneys on the case for review and annotation. Users can then forward the final revised document to their clients' in-house counsel via LEXIS® Counsel Connect, a legal communications and information service.

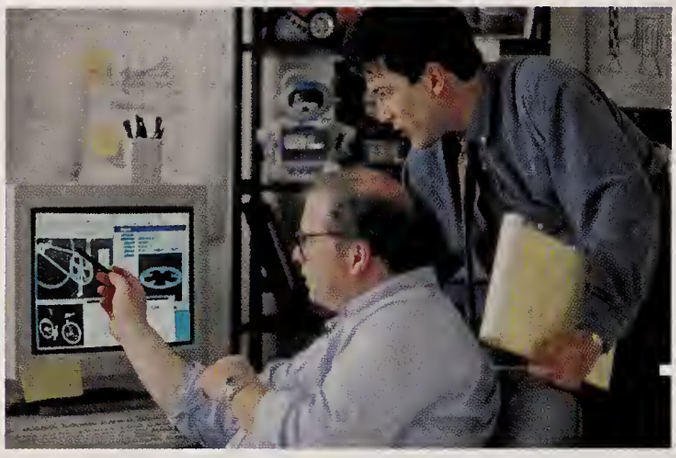
Specialized tools for vertical markets such as insurance and law help small staffs compete with their larger counterparts.

Services and products such as these go a long way toward leveling the playing field with large competitors.

For more insurance information, call Bill Coates, AMS, at (617) 982-9400. For more information on legal services, call Mead Data Central at (800) 253-5624.

MANUFACTURING

Process Reengineering Maximizes Efficiency



Technical desktop workstations, capable of powering business and engineering applications from the same machine, let engineers work more efficiently while decreasing costs.

With the need to decrease time to market, increase customer satisfaction and lower operating costs, manufacturing firms are taking a hard look at all of their enterprise processes and reengineering them for maximum efficiency. They are finding that efficiency is derived from utilizing and sharing information effectively. Gone are the days when the shop floor and business office functioned as separate entities. Today, client-server computing lets firms design their processes for maximum information sharing and efficiency throughout the enterprise. As a result, factories are moving off of costly legacy systems and on to more flexible client-server systems.

For instance, process control data that has traditionally been downloaded to minicomputer or mainframe machines for analysis can now be fed into a PC running the Microsoft® Windows™ or Microsoft Windows NT™ operating system on the shop floor. Analysis takes place on the PC, and the information is made available immediately.

With this speedy feedback, operators can continuously evaluate line performance, quickly respond to problems as they arise, and react to new customer demands. This enables manufacturers to move from batch manufacturing to "make to order" manufacturing.

Two desktops in one

This type of increased efficiency can be seen on the technical desktop as well. Currently, many engineers have two systems on their desks: a UNIX®-based workstation running CAD/CAM applications and a PC to handle business tasks such as word processing, engineering analysis, electronic mail and presentation graphics. Today, with Microsoft Windows NT and the new hardware designed around the MIPS®, Alpha AXP™ and new Intel® chip architectures, an engineer needs only one machine on her desk to run both engineering and business applications. This lets an engineer work more efficiently while decreasing operating costs.

Several major corporations have transitioned to this type of client-server system for CAD/CAM, plant data and utilities management, integrating a Microsoft Windows NT-based Intel Pentium™ TD-2 personal workstation from Intergraph Corp., based in Huntsville, Ala., with Microsoft Office, technical applications and high-performance graphics subsystems. With this single system an engineer can download files from a public server, use them to create a design or map with Intergraph's drafting applications, embed that in a document or spreadsheet, and then send those files out to various members of an organization via electronic mail.

Intergraph markets nearly 900 applications for architects, engineers, construction managers and publishers. More than 100 of those are available on Microsoft Windows NT, with 200 more expected by the end of 1994.

"Microsoft Windows NT offers a robust operating system without complexity, and most of our 3,000 developers are focused on it now," says Tom Steele, executive vice president of software systems at Intergraph. "Within about 600 of our applications, we have 135 million lines of UNIX code, which we have worked on for more than 10 years. The fact that in about two years we can migrate that whole set of code to Microsoft Windows NT gives you an idea of how developer-friendly Microsoft Windows NT is. In fact, much of the code that we wrote for UNIX is built in to Microsoft development tools and Microsoft Windows NT."

The bottom-line impact of client-server systems in manufacturing is: lower operating and service costs, increased engineer and operator efficiency, and shorter time to market. The bottom line impact of developing on the Microsoft Windows NT platform: robust solutions, faster.

For more information, call Intergraph at (800) 345-4856.

RETAIL

Harnessing Retail Data Yields Competitive Gains

In this era of diminishing margins and strong competition among established chains, retail organizations are racing to reduce operating costs, shorten purchasing and stocking times, and get real-time information to decision makers as quickly as possible. However, typical retail operations still have a half dozen different data sources as well as separate operating environments that run hard-to-use applications. Rarely do they have tools to manage or develop for that maze of hardware and software.

In response, many large retail operations are migrating to an open, standards-based architecture that utilizes and integrates existing systems with a coherent, easy-to-use front end. With these solutions, users can access merchandising, point of sale, inventory, and financial data, even if the data is located in disparate areas. They do this via Microsoft® Windows™-based applications that are easy to use for less skilled or unskilled workers.

Post Software International (PSI), a Microsoft Solution Provider based in Wake Forest, N.C., and the world's largest independent software vendor in the retail industry, is working with several major discount and department store retailers to install PowerSTORE, its client-server in-store-based solution.

PowerSTORE provides an application-development framework that is based on Microsoft products including the Microsoft Windows™ for Workgroups operating system with integrated networking and Microsoft Visual Basic® programming system. The promise of the multimedia PowerSTORE system is that end users can keep their minds on business with easy-to-use, intuitive tools, and those tools can be used to develop retail-specific applications for stores.

For example, at point of sale, the salesperson at the cash register is assisted by PowerSTORE in several ways. After the system scans the item's bar code, it retrieves the price and description from the database, along with customer-specific purchase information that can be used to assist the salesperson in suggestive selling. Tax is added automatically, and the sale totaled. The salesperson is then presented with a graphical depiction of payment options, including pictures of credit cards.

An example of effective use of multimedia is the occasion where the cash register receipt tape runs out of paper. Here, the salesperson can immediately get a short video training, shown on the monitor used by the cash register, on installing more paper. The same monitor can display current print or TV ads, as well as a "merchandise locator" that shows an image of an item and data about which stores have it in stock. All these features increase the salesperson's opportunities to provide better service and improve sales.

In-store-based systems that retrieve customer-specific purchase information at point-of-sale assist salespeople in suggestive selling.

The multimedia capability of Post Software International's PowerSTORE includes on-line help sequences for procedures such as changing the cash register tape.

Managers can use PowerSTORE to monitor cash register activity and coordinate those numbers with inventory control, commission reporting and segment marketing. They can analyze "critical success factors" — such as inventory of primary items that draw customers in, or how well high-margin items are moving — or look at the store floor layout, then drill down into any department and see what stock is on the shelves.

If sales are down in a particular store, a manager can get real-time data on which division and which segment of that division is responsible. Once that's identified, a manager can use a "remedy" checklist to confirm what has been or can be done to solve the problem.

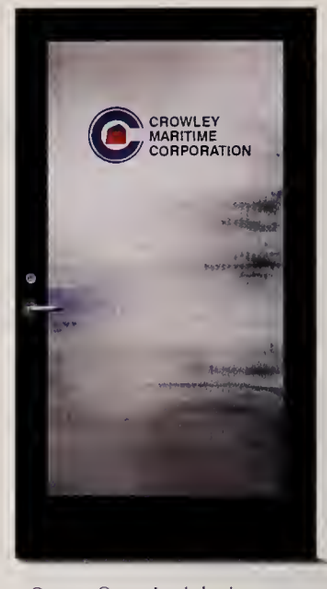
Managers can also monitor performance of individual salespeople and departments over a week, month or quarter, and call up employee profiles that contain previous performance reviews, job productivity and customer service ratings.

The competitive advantage in retail comes from managing inventory, serving customers and accounting for sales. The most successful chains are using information technology systems such as PowerSTORE to help them achieve those ends.

For more information, call Post Software International at (919) 556-6721.

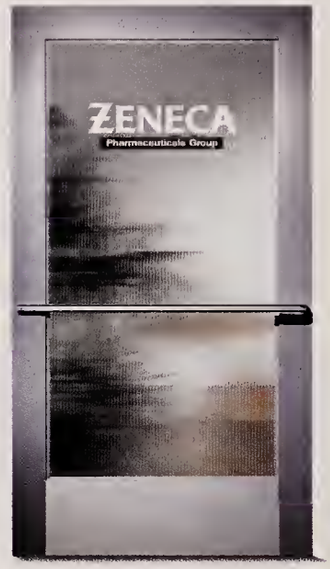
Since Lante Corporation created a sales toolbox using Microsoft Office and Visual Basic®, sales have increased 128%.

Wonderware Corp. created a Microsoft Windows®-based control system at one-fourth the cost of a typical configuration.



Gateway Group, Inc. helped integrate Microsoft SQL Server into an image-based billing system, dramatically improving productivity.

Microsoft Office and WinResources Computing, Inc. made changing menus faster and easier for this popular restaurant chain.



MDL Information Systems, Inc. and Microsoft Office provided productivity tools allowing research scientists to better analyze data.

This securities firm looked to Micro Modeling Associates and Microsoft Office to expedite the delivery of investment research to clients.

MTX International, Inc. and Stanford Business Systems joined this supermarket's accounting and point of sale system with Microsoft Access®.

Platinum Software and Paradigm Technologies implemented a Windows NT™-based client/server architecture, cutting costs 65%.

This law firm now spends less time on paperwork thanks to Quickstart Technologies' use of Microsoft Office and the Windows NT family.

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Laying the Foundation

Microsoft has a complete offering made up of best-of-breed components. Collectively, it's referred to as the Microsoft® Solutions Platform — a combination of products, technologies and services that form the foundation for building enterprisewide, line-of-business solutions around cost-effective microprocessor hardware.

On the desktop, the Microsoft Solutions Platform includes Microsoft Office, a suite of applications that can be customized and programmed using an embedded programming system (Visual Basic® for Applications, Access Basic and Word Basic) derived from the Basic programming language. Other key applications include Microsoft Project, a project management tool, and the Microsoft FoxPro® database management system.

General-purpose development tools are available for the professional developer, including the Visual Basic programming system, Visual C++™ development system, Microsoft Access database management system, FoxPro, FORTRAN PowerStation, COBOL and MASM. These client-side tools are all based on the Microsoft Windows™ family: Microsoft Windows 3.x, Microsoft Windows™ for Workgroups and Microsoft Windows NT™ operating systems.

The server uses Microsoft Windows NT™ Advanced Server and a set of server-based applications, including database management (Microsoft SQL Server™), host connectivity (SNA Server), messaging and information exchange, and system management.

OLE (Object Linking and Embedding) and WOSA (Windows Open Services Architecture) provide the open, extensible mechanisms for adding software components that comply with these standards.

Broadly defined, the Microsoft Solutions Platform also includes third-party hardware, networks and operating systems running on a variety of microprocessor architectures. And finally, third-party applications, tools and services, such as those offered by Microsoft Solution Providers, turn the platform into true solutions for business computing.

DOCUMENT MANAGEMENT

Document Management Key to Mission-Critical Communication

Today, corporations, government agencies, and educational institutions around the world understand that most vital business communication occurs via documents — everything from hard-copy external reports to in-house electronic mail messages. Moreover, as documents have become more sophisticated, enterprises have realized that managing documents as a commodity saves time and money.

Photo by Sgt. Bill Gomez, USAF

Effective document management systems enable both military and commercial sites to control access to files, track document versions, and speed the document routing and approval process.

An effective document management system must allow users to access, save and archive documents in a way that makes them quickly accessible by authorized users.

For the Los Angeles Air Force Base (LAAFB), which builds and buys early warning satellite systems, preparing and managing documents such as requests for proposals (RFPs) had become a protracted and fragmented process. As many as 40 writers composed different parts of the RFPs and kept them on their own hard drives, which made tracking, reviewing, and compiling documents slow and complicated. An RFP for one contract, for example, took six months to develop.

The base generates thousands of documents every year, including RFPs, contracts, correspondence, and communication with Air Force officials in Washington, D.C.

To streamline document management, LAAFB staff consulted with PC DOCS, Inc., a Microsoft® Solution Provider based in Tallahassee, Fla. The base implemented the PC DOCS OPEN object-oriented client-server system, which is integrated with Microsoft Office and Microsoft Project on the client and Microsoft SQL Server™ for Windows NT.

With PC DOCS OPEN, the many LAAFB staff members who compose, edit, review, consolidate and publish the various sections of an RFP can, according to their roles and information needs, find and work with the documents they need at any given time. A user working in Microsoft Word can access PC DOCS OPEN and conduct a search for a particular version of a document. That search employs Microsoft SQL Server™ for Windows NT™, which retrieves the requested document from a storage database and delivers it to the user in Microsoft Word.

RFP developers can now control access to files, track versions of documents, and organize data. They log documents in and out more quickly, get documents routed and approved faster, and collaborate better. They can trace a document's history, research archives and reuse text, all from their desktop or a remote location.

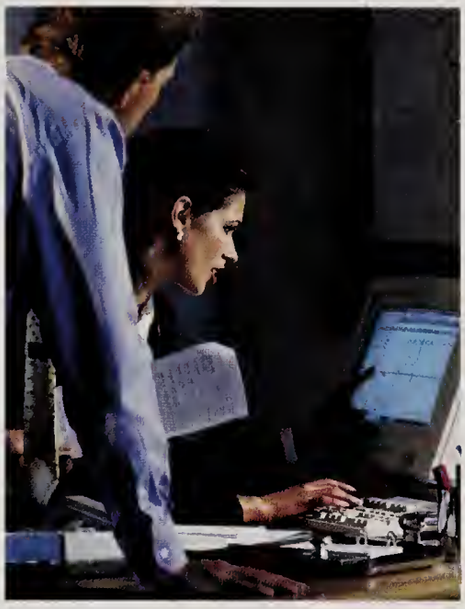
LAAFB users also leverage text from various documents to create briefings in Microsoft PowerPoint, to send messages in Microsoft Mail, and to annotate Microsoft Excel spreadsheets.

"We're more productive in that we spend less time looking for information and more time working with it," says 1st Lt. Mike Alford at the Space and Missile Systems Center at LAAFB.

For more information, call Marcia Artale, PC DOCS, at (800) 933-3627.

ACCOUNTING

Accommodating Change in Accounting's New World



Significant cost savings are being realized by firms that have given financial decision makers greater access to enterprise data.

Finance departments today are in flux. Profit and loss responsibilities are being decentralized. Planning, budgeting and decision making all happen faster. Financial data is used strategically throughout the enterprise, and accounting can no longer serve as a data "silo." Many organizations are reengineering their businesses to focus across departments on processes such as order management, cost analysis, and customer relations.

As corporations move to modernize their financial systems to accommodate these changes, they find that their legacy computing systems often are not flexible enough to adapt. Increasingly, the interrelated pressures of organizational change, demand for real-time information, and rapid technology improvements are coming to bear on old mainframe-based systems.

One corporation that unlocked data for enterprisewide distribution is Toronto-based George Weston Ltd. As Canada's fifth largest company with annual revenues of $11.9 billion (Canadian), Weston operates a family of diverse firms in Canada and the United States.

Weston wanted to give its corporate financial decision makers greater access to strategic information to reduce the time and cost of analyzing that data. The corporate office adopted a client-server solution from Platinum Software Corp., a Microsoft® Solution Provider based in Irvine, Calif.

SeQueL to Platinum, a client-server system for graphical management accounting, runs on the Microsoft Windows™ for Workgroups operating system and allows Weston analysts to download data to their desktops from various enterprise and divisional sources. The company's former accounting package, developed in-house, had limited capabilities; it couldn't be used for budgeting or accounts receivable, and analysis tools weren't available inside the application so reports had to be custom-programmed.

Using SeQueL to Platinum, more people can contribute. For example, department managers can complete financial queries that in the past could be done only by the accounting group. Departmental budget analysis and activity-based reporting has also begun.

Users query the Microsoft SQL Server™ relational database for information and download it into Microsoft Excel. From Excel, they can perform sophisticated analyses on it. Charts and data created in Microsoft Excel can then be imported and linked to Microsoft Word documents and shared quickly and inexpensively via Microsoft Mail. On the back end, Microsoft Windows NT™ Advanced Server is integrated with the company's legacy systems, and data is updated in real time.

Weston originally migrated its central accounting system to SeQueL to Platinum on an OS/2®-based network. However, in January 1994, the firm moved the system to Microsoft Windows NT and immediately recognized a 30 percent to 40 percent increase in system performance and improvement in fault tolerance, said Mark Lefneski, Weston's manager of business systems.

Weston anticipates significant cost savings by aggregating the benefits and insurance accounting for all of its companies using the new system, Lefneski says. The company is reengineering its human resource processes to take advantage of the system as well.

Using the Microsoft Solutions Platform of products, Weston met its goals of widening access to data for financial managers, shortening report generation time, and making way for more cost-effective ad hoc reporting. The firm is encouraging all its subsidiaries to migrate to the new client-server system.

A different situation faced the Carolina Panthers, a new franchise of the National Football League. In building a computing strategy from ground zero, the Panthers wanted a powerful, integrated system for handling all facets of their business.

By allowing financial analysts to download data to their desktops and do budgeting and analysis from within their applications, companies are simplifying ad hoc reporting and reducing report generation time.

Accommodating Change in Accounting's New World

(continued)

Like other NFL franchises, the Panthers started with a DEC® Alpha AXP™ system. They chose to power it with the Microsoft Windows NT™ operating system to handle the high volume of transactions they expect — upwards of 100,000 receivables and a customer database of 25,000. They developed a custom ticketing application and chose Great Plains Dynamics® from Great Plains Software, a Microsoft Solution Provider in Fargo, N.D., as their accounting package. The Panthers will be upgrading to Dynamics C/S+, the client-server version of the product scheduled for release in the summer of 1994.

Boosting analysis functions

The Panthers' office staff, using more than 30 PCs running Microsoft Windows for Workgroups, will be able to use the ticketing program, Dynamics C/S+ and Microsoft Office applications to perform ticketing, accounting and all business and analysis functions. Once they enter data into the system via the ticketing program, it is stored on and accessible via the server. It never needs to be rekeyed, and it will be available via Dynamics and Microsoft Office applications. Because the software is integrated, users can also perform sophisticated "what if?" analyses, such as projecting season ticket sales, estimating concession and souvenir revenue, and monitoring player contracts.

The applications are integrated via DDE (Dynamic Data Exchange) and OLE (Object Linking and Embedding) 2.0, so a Microsoft Excel chart in a Microsoft Word document can be changed from within Microsoft Word. The document and spreadsheet can be linked so when the data in the spreadsheet is changed, it is automatically updated in the document. Users formulate queries in Microsoft Excel, the ticketing software or Dynamics C/S+, and Microsoft SQL Server, on the back end of the system, retrieves the requested data for manipulation on the desktop.

Whether you're migrating from an old system or starting from scratch, client-server systems powered by Microsoft Windows NT and utilizing Microsoft Office applications in conjunction with other solutions provide a solid foundation for your business computing strategy.

For more information, call Platinum Software's Product Information Center at (800) 426-0469 or Great Plains Software at (800) 456-0025.

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Users willing to wait for workflow apps

By Rosemary Cafasso

Although application software providers are pumping up their client/server offerings with workflow technology, users are only slowly warming to this concept.

"To be honest, it's a cool idea, but we are so wrapped up in installing [the application software] that it is the least of our worries," said Steven Wells, director of information services at Suburban Propane Co. in Whippany, N.J., which recently purchased SAP America, Inc.'s R/3 client/server application suite.

Despite the tepid response from Wells and other users contacted last week, client/server application companies are going big guns with workflow. In short, it is becoming the latest card to play. And industry analysts expect that long-term workflow will provide a big payoff to client/server users.

"I think workflow within business applications is where it will have its greatest value," said Tim Harmon, a program director at Meta Group, Inc. who said companies can use these applications to adopt more flexible business processes. "Much of what a company did was driven by back-office systems, and now it is the other way around," he added.

Most client/server application vendors are either currently providing some workflow functions or are scheduled to do so. For example, Dun & Bradstreet Software is positioning workflow as a fundamental piece of its SmartStream offering, and SAP rolled a workflow engine into its R/3 platform early this year. PeopleSoft, Inc. has been promoting a multipronged plan for workflow since last year and plans to release workflow functions in October.

Runs the gamut

In short, the workflow concept covers a number of technologies from traditional electronic-mail systems such as Microsoft Corp.'s Mail, which can route documents, to forms software that can automate the flow of electronic paperwork from companies such as JetForm Corp. More complex products, such as tools from Action Technologies, Inc., help users design new work procedures. Other providers such as FileNet Corp. offer document management and workflow as a complete system.

The idea behind the workflow strategies of the client/server applications providers is to provide some combination of these functions within the applications so users can automatically make use of them as they deploy their applications.

In the case of Dun & Bradstreet, for instance, one of SmartStream's core functions is a workflow component that automatically generates work by routing tasks.

A task could be a report that needs additional information from other users or a purchase order that requires authorization. In SmartStream, the actual documents are not moved from one desktop to another. Instead, a message triggers a notice to users that a task is pending.

For several users, such functionality sounds promising, but for now it has been relegated to the futures pile.

"As a concept, we very much embrace it," said Larry Brownlee, controller at Oglethorpe Power Corp. in Atlanta where SmartStream is installed. "The more we can let the system work for us, the more it will make us productive. We are now involved in getting this thing running, and until you've got some of the basic system handled, workflow is kind of a separate question."

Wary of commitment

Doug Gosling, manager of financial systems at Ontario Hydro and a SmartStream user, said he can see workflow functions helping to re-engineer business processes such as financial operations. However, Gosling said his team has not selected SmartStream applications beyond the decision-support system and "has made no commitments yet."

One SAP America user said he was not aware that his vendor had added a workflow engine to R/3 earlier this year. "I don't think the user community really cares if SAP has what it calls workflow," said Jack Spurgeon, a vice president and director at the Systems and Computer Services Division of Eastman Chemical Co. in Kingsport, Tenn. "All they care about is the ability to move documents around."

Working on workflow

Many client/server software vendors are adding various types of workflow capabilities to their applications

Company	Workflow approach	Availability
Dun & Bradstreet Software	• SmartStream components route direct tasks, message-driven function generates to-do list	Now
PeopleSoft	• Forms engine, built-in workflow functions, support of third-party workflow packages	October
SAP America	• Workflow engine to route activity across application	Now
	• Plans to support third-party workflow tools	Not scheduled

Database vendors stall NetWare moves

By Kim S. Nash

Key relational database providers have a ways to go in supporting the latest iterations of Novell, Inc.'s NetWare network operating system, slowing the rate at which users put critical departmental-level applications in a client/server environment, observers said.

NetWare platforms "are certainly important, but none of them — Oracle, Sybase, etc. — has done a very good job there," said Rich Finkelstein, an analyst at Performance Computing, a consulting firm in Chicago.

Server-level relational databases have historically catered to Unix users. Only relatively recently have PC-level systems become viable as servers, Finkelstein explained, so Unix database makers have less experience in that area.

Oracle Corp. has perhaps made the furthest inroads, Finkelstein said. The Redwood Shores, Calif., company signed a pact with Novell a year ago that bundles Oracle's database, electronic mail and other products with NetWare 3.12 and 4.0. NetWare resellers sell the package, which is called OracleWare.

Even so, Oracle does not have that much to coo about, Finkelstein said, adding that the Oracle 7 database does not support NetWare Directory Services, the crown jewel in NetWare 4.0.

Relational database support of NetWare 4.0 and 4.1 is key to putting truly meaty client/server systems on Intel Corp.-based hardware, said Ed Eloian, president of A&I Technologies, Inc., an OracleWare reseller in western Pennsylvania.

Eloian started selling OracleWare early this year, but "we expect to do a lot more business next year when 4.0 is supported," he said.

Database gap

Meanwhile, Sybase, Inc.'s recent split with Microsoft Corp. over their once-shared SQL Server database has forced Sybase "to figure out how to support the [PC] platform overnight," according to Finkelstein. The Emeryville, Calif., database maker formerly pointed users toward Microsoft for relational database systems on PCs. Now, Sybase and Microsoft are essentially competing, but Sybase "has no infrastructure to please PC users," he said.

To start filling that hole, Sybase has been nosing around Novell, looking for a NetWare bundling deal possibly similar to Oracle's, industry sources said.

Sybase declined to comment on NetWare plans, except to say that it will put the latest System 10 version of SQL Server on Novell's network operating system "this year," according to a spokeswoman.

For now, if Sybase users want to run NetWare, they have to back up to SQL Server 4.2.2 to do so. The previous release of SQL Server — 4.9 — does not support NetWare.

The Ingres 6.4 database from The ASK Group, Inc. is certified for NetWare 3.12 and is due to ship for NetWare 4.01 next month, a spokeswoman said.

Informix Software, Inc. sees little reason to support NetWare extensively. While it has versions of its Informix-OnLine and SE databases for the 3.0 releases of NetWare, Informix has no plans to support 4.0 releases, said Steve Sommer, vice president of marketing.

"We're not real big fans of the NetWare environment," Sommer said. "We're seriously supporting UnixWare." So, too, does Informix stand behind Microsoft's Windows NT, with a bundling deal that lets Informix resell NT with its databases. NT and NetWare are fast becoming fierce rivals for departmental networks.

Net where?

THE LATEST DATABASES FROM KEY INDEPENDENT RELATIONAL VENDORS HAVE SOME CATCHING UP TO DO IN NETWARE SUPPORT

	NetWare versions		
	3.12	4.0	4.1
Informix 6.0	Yes	No	No
Ingres 6.4	Yes	Planned for July	Planned for July
Oracle 7	Yes	Yes*	Planned for 1994
Sybase System 10	No	Planned for 1994	Planned for 1994

*Does not support NetWare Directory Services

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Second, major software companies are introducing new high-speed versions of their software to take

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Virtual reality takes architectural leap

By Stuart J. Johnston
SEATTLE

The heart of Seattle's marine industrial neighborhood is probably the last place you'd expect to find the state of the art in virtual reality systems. Still, Worldesign, Inc., whose offices are above an antique store, is working on anything but antiques.

In fact, the start-up company has tapped into a vision of how to apply virtual reality to real-world problems.

Earlier this month, Worldesign gave a preview demonstration of its Virtual Environment Theater technology, which will debut at A/E/C Systems '94 in Washington this week.

The demo gives a virtual reality tour of the port of Seattle's long-term plans for the area's central waterfront development project. The tour lets users examine proposed buildings and waterfront expansion without stretching their imaginations.

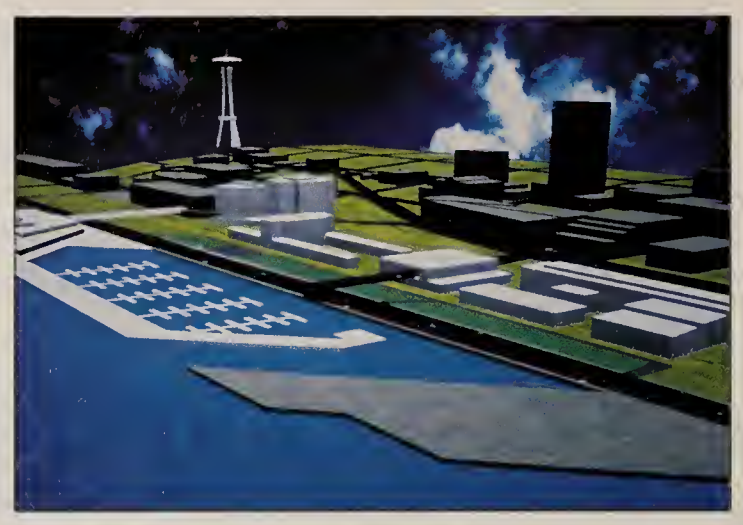
"The way they've conceptualized the idea [of applying virtual reality to visualization] is pretty impressive," said Mike Gaffney, an architect who is head of visualization at The Callison Partnership, a 300-employee architectural firm in Seattle. "The potential for being able to see the visual impact of the architecture on the landscape and the environmental impact of things like wind on a building is just tremendous."

Today, architectural visualization is done the traditional way, with scale models and drawings, or with somewhat higher-tech methods such as videotaped animation and computer-rendered still pictures. But that is changing.

Viewers in the theater find themselves seated inside a sort of "vehicle" — a structure with a roof, windows in front and on the sides and a dashboard equipped with a computer keyboard. The windows are rear-projection screens.

All aboard

The operator uses the keyboard to give the "passengers" a tour of the Seattle waterfront area from any vantage point. They can "fly by" buildings that have not yet been constructed, drive down streets to see the impact of urban canyons yet to be created or sail past the waterfront on a boat in Puget Sound.



Worldesign's Virtual Design Environment *lets the user 'drive' or 'fly' around the proposed development*

"The theater is a space vehicle," said Robert Jacobson, Worldesign president and chief executive officer. "You can drive, fly, float and go backward in time."

Although Jacobson conceded that this is only a demonstration, he said real applications are not a huge leap. Because the system's database can integrate information from diverse sources, including geographical information systems (GIS), computer-aided design (CAD) drawings and scanned photos, such a planning tool would be extensible over time.

"The key is to have a central repository so that it becomes a self-sustaining database," Jacobson said. As more data becomes available to users, the model of the world is gradually enhanced to provide more and more detail.

One of the benefits of the system that Worldesign will show in Washington is cost. Whereas most virtual reality systems rely on expensive graphics workstations that cost as much as $250,000 each, Worldesign's demo uses three relatively inexpensive Digital Equipment Corp. Alpha AXP machines equipped with graphics boxes from Kubota Graphics Corp.

Jacobson did not provide overall cost figures for the system, but some Alpha models currently cost less than $5,000.

Worldesign's demo system was built using Digital's version of Unix because the tools the company needed to create it do not run on Microsoft Corp.'s Windows NT yet, said Peter Wong, Worldesign's director of design services.

There are drawbacks to Worldesign's less-expensive hardware approach, of course. The resolution is not as good as a pricier system would provide, and the speed suffers if the viewer wants to swoop past entirely modeled building surfaces instead of just wire frames of buildings and piers.

Obstacles remain

Other hardships await those incipient urban planners who want to model their cities today as well. Gathering data to use in an urban-planning application is no picnic because it is not all available in a single place, if it is available at all.

Instead, the data, including building plans, is buried in a pell-mell of various local, county, state and national government offices. Data has been lost in the decades since existing structures were built, and much of it is outdated.

When it is available, the data comes in many divergent formats, including GIS and CAD files, which is why the demo system's repository database was designed to accept several formats.

Finally, the demo, which may be refined and included in Seattle's planned Odyssey Maritime Museum, is only one step in a long process for Worldesign.

The company's next step, which Jacobson said will take about 18 months, is to bring to market a software package to let non-computer experts assemble, test and modify their own virtual worlds.

Multimedia strives for interoperability

By Suruchi Mohan

Multimedia technology is trying to carve a niche in the networking arena. Apart from obvious bandwidth limitations on the network, the technology has been slow to take off due to cost and a dearth of real-world applications and service providers.

"The real interest is in real-time, nonvideo collaborative tools," said Paul Callahan, an analyst at Forrester Research, Inc. in Cambridge, Mass. "Video is much too expensive."

The few megacorporations that have implemented multimedia or are in the process of doing so have no one to turn to for a ready-made solution. Instead, they have relied on their own resources (see story at right). But if multimedia is to become ubiquitous, vendors agree they must come up with interoperable applications.

One organization trying to make this a reality is the Multimedia Communications Forum (MMCF), a consortium of vendors seeking to provide multimedia-related services on the network. Interest in multimedia has spawned other groups, too. Chief among them is the Interactive Multimedia Association (IMA).

What's on the way

The MMCF expects application growth in the following areas:

- Desktop videoconferencing and collaboration.
- Video on demand.
- Multimedia messaging and mail.
- Multimedia information services.

The MMCF is trying to extract user needs from these applications and come up with the specifications for an architectural model for multimedia networks that will let end users work with any application regardless of the underlying infrastructure.

The MMCF is working to finalize the specs for the Transport Service Interface, which talks to the transport domain, or Layers 1 through 4 of the Open Systems Interconnect stack. Sitting on the transport interface is the middleware stack, also to be defined by the MMCF, and the application programming interfaces. At the top of this stack is the user's application. Some of these specs will start rolling out in the fall.

The group is also working on specs for a Management Information Base (MIB), expected to be available for review by year's end. The specs will be sent to the Internet Engineering Task Force to be incorporated into a standard to help network administrators manage or supervise multimedia applications running on the network. This MIB will support Simple Network Management Protocol.

Users will see products that support these specs by the middle of 1995 at the earliest, according to Wayne Zakowski, chairman of the technical subcommittee of the MMCF in Denver.

Make-it-yourself multimedia

The northern California division of Kaiser Permanente Health Plan, Inc. is using its own telephone system, with several T1 lines, to hold teleconferences among its various sites. The health maintenance organization is using videoconferencing for telemeetings, teletraining and telemedicine.

Twice a week, lunch-hour meetings are conducted at 15 major medical centers. For example, the hospital in Sacramento, Calif., has clinics in five surrounding areas. Approximately 150 doctors at the hospital have videoconferences with the other locations.

The savings total $1.5 million a year, according to Bob Bodine, director of audiovisual and teleconferencing at Kaiser Permanente in Oakland, Calif.

Wheaton, Inc., a Millville, N.J.-based company that makes plastic bottles, uses IBM's Paperless Manufacturing Workplace software to train its machine operators. Each machine is equipped with a 486-based PC that displays full-motion video, graphics and computer-aided design drawings.

The Prudential Health Care System is setting up a frame-relay network that will connect the primary health care centers in 11 cities in the Southeast.

The project will allow doctors at the centers to exchange patient records — X-rays or CAT scans — over the wide-area network. — *Suruchi Mohan*

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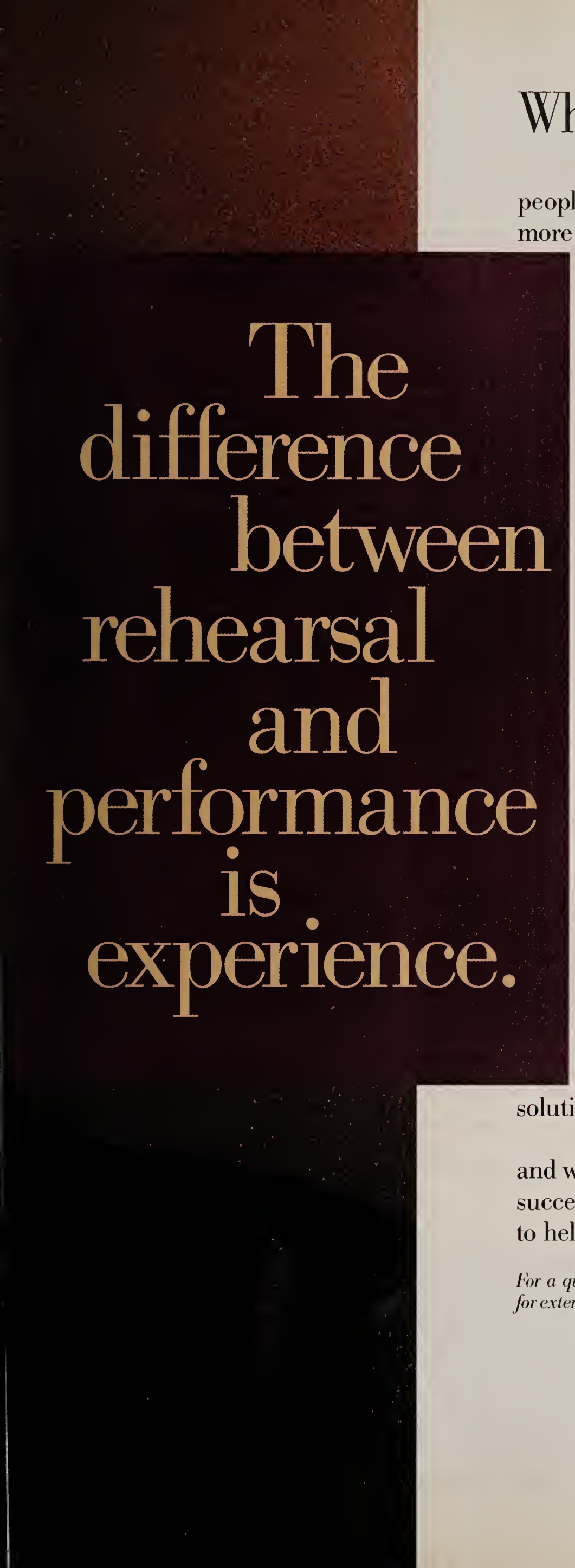

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Commentary

David Coursey

Treading water

Lotus' Notes is near its high-water mark. Soon Notes will lose its luster of being "all things groupware" and become one of several — perhaps even many — workgroup applications and tools.

This is good because Notes has defined the field for too long, and competition will inspire new ways of thinking.

Like many, I was enamored of Notes from the very beginning — which is to say, from Notes' introduction — until I actually sat down with my very own copy. Then it became clear that Notes would not, all by itself, change my life.

First, Notes lacks what most people would call a user interface. There are user controls — dozens of them in tool bars, which you have to call up based on what you hope to accomplish — but nothing close to a user interface as I have come to know it.

Notes is also, out of the box, a lousy electronic-mail client. And because I am not a Notes programmer, there was little I could do to change this situation, so I abandoned Notes.

Notes apologists would point out, and rightly so, that Notes is only as good as the applications built on it. That's true enough, which further explains why Notes isn't on my desktop anymore. But neither is a copy of C++.

> You have to wonder why, if Ami Pro and CC:Mail are as wonderful as Lotus keeps telling us, the vendor was so quick to bolt when alternatives appeared.

And as for Notes apps, one of the nice things about competition is that people will stop trying to build relational database applications in thoroughly unrelational Notes.

Competition will also bring a sigh of relief to those in the IS community whose bosses have been so thoroughly propagandized that they see Notes as the cure for all problems, real and imagined.

At the low end, Notes is already seeing its "bulletin board" features copied — though not exceptionally well — by a Silicon Valley company called Collabra, founded by a former CC:Mail executive. The big E-mail competitors are looking at ways to offer better shared messagebase features, and other companies are also expected to join the fray.

Client/server database tools allow Notes-like applications to be built atop messaging protocols, and replicated databases should become more widely available for applications requiring them. As LANs become more workflow-oriented, Notes-like applications will become grist for Visual Basic programmers and workgroup-specific tools will multiply.

At the same time, Lotus will continue improving Notes, perhaps positioning it as a general-purpose workgroup development/user environment. Ease-of-use improvements for both programming and user interface are in the works, and Lotus applications are starting to make good use of links to Notes object stores.

So, Notes won't die — in fact, sales will probably increase for the foreseeable future — but the product will no longer define an entire area of desktop technology.

I mention this in light of Lotus' unsuccessful billion-dollar-plus play for WordPerfect. Had it been successful, Ami Pro and (probably) CC:Mail customers would have been forced to move to WordPerfect-developed products.

You have to wonder why, if Ami Pro and CC:Mail are as wonderful as Lotus keeps telling us, the vendor was so quick to bolt when alternatives appeared. I'd bet Lotus has some real explaining to do to the respective development teams — and to the big customers, too.

Now that WordPerfect and Novell appear linked — despite what some saw as Lotus' efforts to scuttle the deal — Lotus' future appears to have dimmed a bit. No matter how much the company is able to temporarily pump up its stock price with dubious news like the deal with AT&T to create public Notes servers, Lotus is likely to find itself less and less able to compete as Microsoft and Novell dominate the marketplace.

One solution frequently mentioned in some circles is for IBM to buy Lotus. Big Blue would give Lotus the staying power it needs, while Lotus would guarantee IBM a source of OS/2 applications and a credible place in the desktop and networked software business.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4460.

New Products

Digital Communieations Assoeiates, Inc. has announced QuickApp for Windows 2.1, a terminal communications middleware tool that transparently integrates legacy data into new client/server applications.

According to the Alpharetta, Ga., company, QuickApp for Windows 2.1 includes Microsoft Corp.'s OLE Custom Controls, which give users the flexibility to manipulate data between legacy and desktop applications.

It also contains a navigational feature that eliminates the need to write High-Level Language Application Program Interface code because it records the terminal communications process.

QuickApp for Windows 2.1 costs $995.

▶ *Digital Communications Associates*
(404) 442-4264

Iomega Corp. has introduced Tape250 Parallel Port II, a tape backup drive.

According to the Roy, Utah, company, the product uses the IEEE 1284 parallel communications specification, is bidirectional Enhanced Parallel Port-compatible and ships with Iomega backup software.

The product is priced at $399.

▶ *Iomega*
(801) 778-1000

IBM has announced the Visualizer family of modular software for querying, analyzing and presenting data.

According to the company, data sources and Visualizer modules are represented as symbols or objects that can be easily moved around the desktop.

Results can be communicated across a workgroup through Dynamic Data Exchange-enabled desktop applications.

Modules include Query, Charts, Procedures, Development, Ultimedia Query, Statistics and Plans.

Prices range from $199 to $549.

▶ *IBM*
(914) 765-1900

SoureeMate Information Systems, Ine. has introduced AccountMate Premiere Payroll, a payroll entry and tracking system.

According to the Mill Valley, Calif., company, the product handles regular employees and independent contractors, prints or records payroll and tax deposit checks, generates tax return information, prints forms, records cancelled checks and generates reports.

AccountMate Premiere Payroll also features direct deposit and the ability to update W-2 information.

Prices range from $595 to $1,195.

▶ *SourceMate Information Systems*
(415) 381-1011

Century Analysis, Ine. has introduced TDM Version 2, an object-based transaction distribution manager.

According to the Pacheco, Calif., firm, TDM synchronizes the data of multiple applications when a transaction newly inputted in one of the applications needs to be reflected in the other applications.

TDM operates in a noninvasive manner, so applications participating in the data synchronization process do not need to be modified.

Prices start at $10,000.

▶ *Century Analysis*
(510) 680-7800

Computer Systems Advisors, Ine. has announced Datarun, a product that supports development of client/server applications.

According to the Woodcliff Lake, N.J., firm, Datarun is a methodology designed for groups building large, enterprise-wide, cross-functional applications.

Features include rapid delivery of applications, a controlled, model-driven form of iterative development and single-model development for close integration of data.

Datarun costs $26,500 for a site license.

▶ *Computer Systems Advisors*
(201) 391-6500

OPN Systems, Ine. has introduced OPN:Office 7.3, an office automation system designed to connect Unix users within large organizations.

According to the Fort Wayne, Ind., firm, OPN:Office 7.3 includes a graphical user interface that supports X Window System terminals and PCs running an X terminal emulation package.

Features include advanced document management, connection of diverse terminals, PCs and workstations to servers, automatic personal and group calendaring and scheduling, gateways and desktop publishing.

Prices range from $129 to $695 per seat for consecutive users.

▶ *OPN Systems*
(219) 455-2758

Digital Equipment Corp. has introduced AdvantageCluster Fileserver 3000.

According to the Maynard, Mass., company, the server provides high compute performance configurations and exceptional file server performance.

The product performs 4,817 Network File Service operations/sec., has an average response time of 26.4 msec and is scalable beyond current configurations.

Prices start at $272,000.

▶ *Digital Equipment*
(508) 493-5111

Product shorts

Open Data Corp. has announced FindOut, a data access tool. The product comes in two components: FindOut Analyst for information users and FindOut Builder for information systems professionals. Features include a business dictionary, an automated modeling tool, reports and an ad hoc query and analysis tool. Cost: $995 for FindOut Analyst and $4,995 for FindOut Builder. Open Data, Lexington, Mass. (617) 860-8300. ... **Ramco Systems Corp.** has introduced the Marshall Series, a family of 12 seamlessly integrated enterprise management products. Systems fall under the categories of finance, distribution, materials, manufacturing, personnel and productivity. Cost: $40,000 to $75,000 for one system. Ramco Systems, Sunnyvale, Calif. (408) 522-8080.

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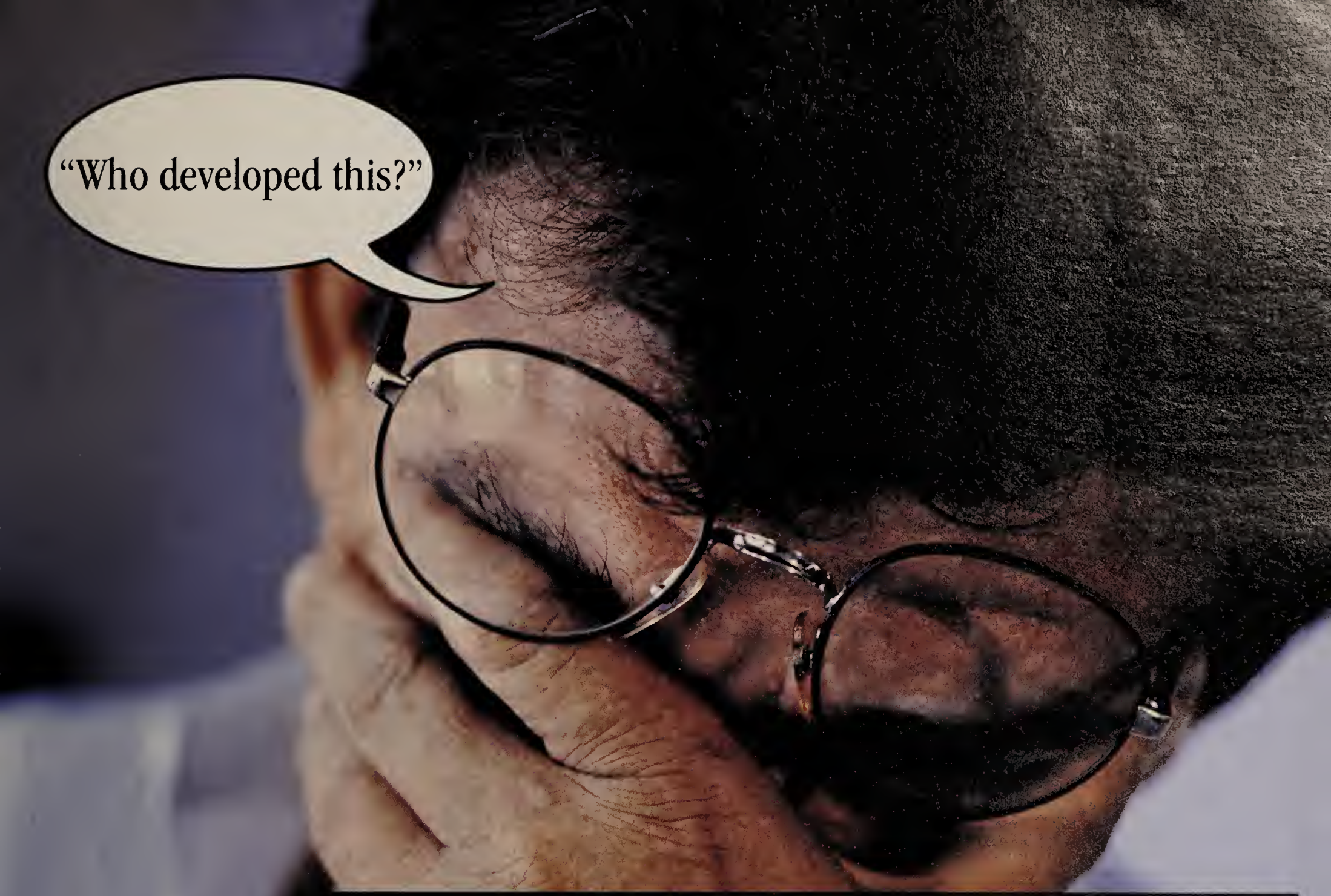

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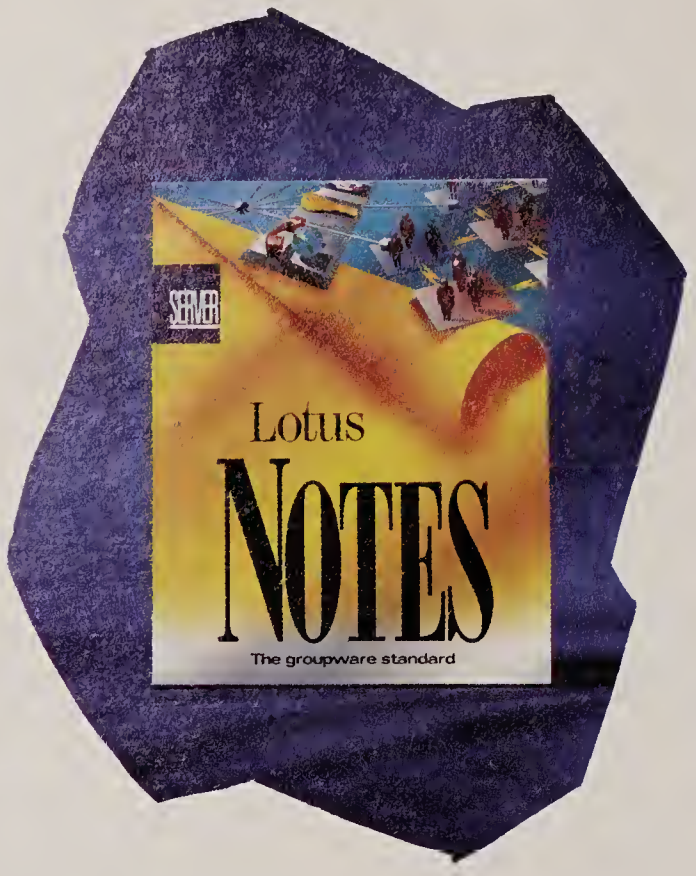

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Ami Pro evolves from word processor to a highly flexible environment for creating and managing the flow of workgroup documents.

Freelance Graphics becomes a presentation management system where team members can work together, or browse through individual slides of past presentations, to create their own custom presentations.

NOTES FROM THE FIELD

To improve productivity, the State of Oklahoma chose to equip many of its public agencies with SmartSuite and Notes. Used by officials for idea and strategy sharing, these applications are also used by thousands of employees around the state with desktop and laptop computers to share information on finance, health, and crime control, among other applications. The move has proven very popular, and more government departments are considering going on line with both SmartSuite and Notes.

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Rmon not a network cure-all – yet

By Steve Moore

As vendors build Remote Network Monitoring (Rmon) support into routers, hubs and operating systems, network managers may some day be able to do away with their stand-alone hardware or software protoeol analyzers. However, users first want to make full use of their investments in stand-alone analyzers.

"I don't know that I'll do away with my LAN analyzers. They're bought and paid for. But if these Rmon things pan out, and if the pricing is reasonable for the additional capability, I'm certainly not going to have to buy many additional stand-alone analyzers," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, Del.

Vendors recognize that stand-alone analyzers eventually may be shunted aside by built-in Rmon capabilities.

"The stand-alone LAN segment monitor vendors have seen the handwriting on the wall just like Cisco is seeing in the longer term with stand-alone router technology," said John Morency, principal consultant at Strategie Networks Consulting, Inc. in Roekland, Mass. "They can either roll over and die or take their fundamental technology and OEM it to somebody who can add value to it so they can still get some revenue from it."

This trend is reflected by recent vendor alliances. Axon Networks, lnc. in Newton, Mass., struck a development agreement allowing its Rmon technology to be incorporated into the products of Chipeom Corp. in Southboro, Mass. Network General Corp. in Menlo Park, Calif., has a similar paet with SynOpties Communieations, Ine. in Santa Clara, Calif.

"The biggest problem with Rmon right now is that we ean't quantify the amount of traffie aeross our wide-area network as far as souree and destination," Seoggin said.

Further, an overly eomplex user interface ean seriously impair a product that otherwise provides superior Rmon support. "Supporting the basie Rmon Management Information Base [MIB] is not good enough unless you have a front-end application with a user-friendly interface that hides the syntax of the MIB-level detail," said Atul Kapoor, principal eonsultant at Kaptronix, Inc. in Haworth, N.J.

Vendors are attempting to differentiate their Rmon implementations by adding their own proprietary extensions to the basie Rmon standard. "The standard Rmon definition today goes to Level 2, and then it dies," Morency said. "It doesn't say anything about how you do LAN analysis for the upper layers, so if you want to get anything in terms of paeket tracing at Level 3 and above, you go proprietary."

Needs improvement

Rmon technology may reign in the future, but the shortcomings in some Rmon offerings must be eliminated first, observers said. They include the following:

- The inability to extend Rmon functionality across wide-area networks.
- Complex and user-unfriendly interfaces.
- Insufficient interoperability among Rmon implementations that use proprietary extensions.
- A tendency for Rmon activity to overload network processors.

Interoperability questions

But these proprietary extensions raise questions about interoperability. "Users should not buy the produets of any vendor that is not willing to publish its private extensions because you need those to reeeive and fetch information from their SNMP MIB," Kapoor said. "If they give you a copy of their MIB, then you ean install it on any SNMP manager, be it from IBM, Hewlett-Packard or Sun, and then the base platform can read information from those extensions."

Proeessing Rmon traffie ean eat up a lot of system resourees. "If you're buying a piece of equipment that's attempting to use the same proeessor for all this Rmon processing that it's using for its general proeessing, it's quite a load," Scoggin said. "When we looked at the possibility of upgrading our repeater modules in our Cabletron hubs, we found it was less expensive to purehase a stand-alone Rmon probe than it was to upgrade the repeaters."

Start-up launches client/ server mobile software line

By Lynda Radosevich

■ A start-up software company financed in part by Compaq Computer Corp. has begun shipping software that is said to permit mobile workers to access messages and files from a single server-based in-box.

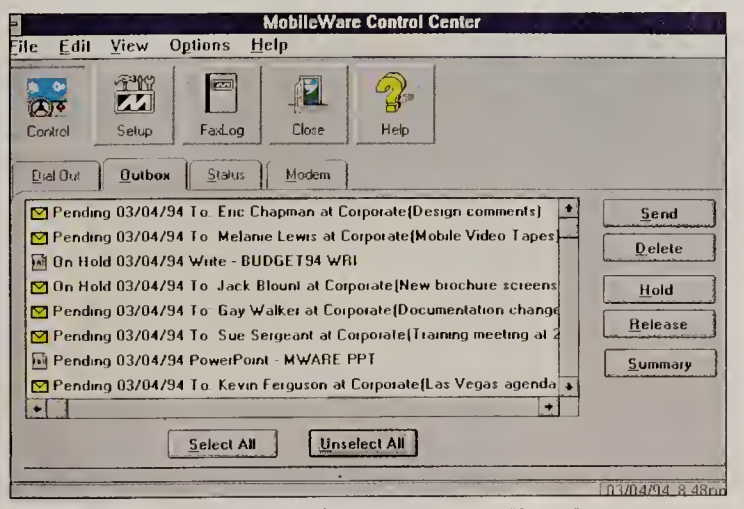
Jack Blount, president and ehief executive officer of MobileWare Corp. in Dallas, said MobileWare 1.0 is elient/server software aimed at Fortune 1,000 companies with large mobile forces, such as sales. It eomprises a client piece that has drivers for LANs and dial-up and wireless networks — ineluding analog eellular networks used by eellular phones.

Through the eommunieations software in the elient, users tap into server software eonnected to the corporate network. This enables them to fax, print, transfer files and send eleetronic mail as if connected locally.

Whilc otncr packages such as Symantec Corp.'s PC Anywhere permit remote network aceess, MobileWare enables users to store all their transaetions and transfer them together to the server during a eonnection, rather than requiring users to remain on-line, Blount said.

For example, a user writing a memo can issue the print command when done. The next time the user conneets to the office server, it will print.

That deferred print/fax eapability is important because "when you're a mobile user, you just issue the command. Then, the next time you eommunieate, it's done and off your mind, rather than waiting until you're connected or baek at the office to print or fax," said Ken Dulaney, viee president of mobile business strategies at Gartner Group, lnc. in Santa Clara, Calif.



MobileWare 1.0, *priced at $280 per user, offers data compression, 32-bit encryption and centratized management*

MobileWare also understands the broader problems faeing the mobile business eommunity, Dulaney said. "You want drivers to pull data from different sourees — E-mail, databases, transaetional systems — and funnel it into a holding pen until the elient pieks it up. On the other end, you want to reverse the process ... piek up the information and split it out to the applications," he said.

While MobileWare provides the framework to support a broad range of elients, currently it supports only Lotus Development Corp.'s CC:Mail for E-mail, and it does not have drivers for direct aeeess to databases. The software's eapabilities would be much stronger, analysts said, if they were built into a sales force automation paekage sueh as Snap from Sales Teehnologies, Ine., an Atlanta subsidiary of The Dun & Bradstreet Corp., or SalesBook from SalesBook Systems, Ine. in Pittsford, N.Y.

Meanwhile, firms such as Millipore Corp. in Bedford, Mass., are using Notes to aehieve disconnected support for mobile sales staffs. But Notes does not have a eapability robust enough to draw from multiple elients, Dulaney said.

Kevin Danehy, manager of workgroup applieations at Millipore, said the MobileWare eapabilities "sound slick."

Millipore pipes transactional data to Notes and uses Notes' replication capabilities to get data to salespeople in the field. However, Notes requires so mueh overhead that the size of the data files grows by roughly 10 times when they are eonverted from the transactional system to Notes, he said.

"If [MobileWare] can suek in data to the server and move files out to the field, it might be a niee way to get around Notes' high overhead," Danehy said.

Greater support to come

The 37-employee MobileWare intends to address some of the support limitations in Release 1.1 later this year and 2.0 early next year, Blount said. For instanee, Release 1.1 will support Mierosoft Corp.'s Messaging Application Programming Interface 1.0. In Release 2.0, the eompany plans to add Simple Network Management Protoeol support, Internet support and drivers for linking in Notes and transactional databases.

Meanwhile, other key features in the eurrent release include the following:

- Communieations agents that monitor transmissions so if the user is disconneeted, the transmission will piek up where it left off.
- Agent teehnology that will notify the user by E-mail or pager about urgent information.
- Centralized management.

The priee per user for MobileWare 1.0 is $280; bulk diseounts are available.

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Remote access

ISDN services get boost from 3Com

By Stephen P. Klett Jr.

Networking vendors are continuing to jump on the ISDN bandwagon to win a share of the burgeoning remote-access market. The end result for users is a less costly way to connect remote offices than traditional leased-line connections such as T1 services.

The latest player is 3Com Corp. in Santa Clara, Calif., which recently announced a suite of Integrated Services Digital Network (ISDN) products, including routers/bridges, adapters and remote-access servers. All the new wares are geared specifically for connecting the remote and personal office. 3Com's move follows on the heels of a slew of ISDN unveilings from companies such as Symplex Communications, Inc., Xyplex, Inc. and Wellfleet Communications, Inc. [CW, April 11].

In addition to being as little as one-tenth the cost of a leased-line connection, ISDN provides higher speeds and greater bandwidth than traditional analog dial-up lines and modems.

Market growth

Frost & Sullivan, Inc. in Mountain View, Calif., projects the market for customer premise ISDN equipment will grow from $2.9 billion last year to $8.2 billion in 1997.

Hurdles to clear

However, despite the fact that ISDN has been around for roughly 10 years, regional Bell operating company (RBOC) coverage is spotty at best, which analysts said is a major hurdle to clear if ISDN is to become ubiquitous.

"The United States is behind in terms of ISDN availability. It's getting better but is still not there," said Jeremy Duke, senior industry analyst at In-Stat, Inc. in Scottsdale, Ariz. Duke estimated that ISDN services were currently available in only 60% of the country. "But this coverage is in pockets, so a manager looking to connect his New York and California offices will most likely have trouble," he said.

However, RBOCs such as Southwestern Bell and Pacific Bell are beefing up their ISDN efforts. Pac Bell, for example, has committed to installing four basic rate interface (BRI) ISDN lines in 7,400 public schools and libraries [CW, April 18].

Practicality is key

In the meantime, ISDN's most practical application may be for the telecommuting market — connecting personal offices of less than 10 people to corporate headquarters.

"Telecommunication and ISDN will have a strong showing in regional areas," Duke said. "We're starting to see signs of that now through product rollouts such as 3Com's and gradual coverage expansion. We're at the tip of the iceberg in terms of remote access and ISDN."

For the small office, 3Com will offer in the fourth quarter a slide-in ISDN module for its AccessBuilder remote-access server that provides four BRI ports. The company will also ship ISDN XT/AT bus and PCMCIA adapter cards and a Personal ISDN Bridge to connect the individual mobile or home user by the end of the year.

Coming attractions

3Com's ISDN rollout will include the following:

	Q4 1994	1995
Remote office internetworking	• Integrated ISDN for NetBuilder Remote Office • ISDN PRI connection for NetBuilder II	• Integrated PRI module for NetBuilder II • Multiport BRI module for NetBuilder
Personal office central connections	• Integrated four-port BRI module for AccessBuilder	• Integrated PRI module for AccessBuilder
Personal office client connections	• Integrated ISDN XT/AT bus (BRI)	• Personal ISDN bridge (Ethernet BRI)
Transcend network management	• AccessBuilder Manager • Remote Office Manager	• Enterprisewide tools

For larger branch offices, 3Com said it will integrate primary rate interface (PRI) ports into AccessBuilder to support up to 30 concurrent users with 256K bit/sec. bandwidth each.

On the router side, 3Com will also integrate dual ISDN PRI ports into its NetBuilder II central site router and one ISDN BRI port into its NetBuilder Remote Office router by the end of next year. Pricing was not available.

Taking a ride on the information highway

CERFnet improves Internet access via SMDS

By Ellis Booker
CHICAGO

In the beginning, the National Science Foundation's network (NSFnet), one of the larger backbones of what is collectively known today as the Internet, ran at a pokey T1 (1.544M bit/sec.) speed. Today it races along at a speed of T3 (45M bit/sec.).

Similarly, the digital "off ramps" to this highway have gotten quicker, too, thanks in part to the California Education and Research Federation Network (CERFnet), the leading Internet access provider in California. The company recently expanded the ways in which its customers can enter the Internet by adding a Switched Multimegabit Data Service (SMDS) from Pacific Bell.

SMDS is a "connectionless" switched public network service ranging in speed from 56K bit/sec. to 45M bit/sec. According to the SMDS Interest Group, Inc. in Foster City, Calif., there are more than 200 SMDS customers in the U.S.

Valuable service

For CERFnet — the first SMDS user in California following PacBell's opening of its service in 1992 — SMDS was valuable for two reasons.

First, it replaced a spaghetti-like configuration of point-to-point 56K bit/sec. and T1 links and associated routing hardware with CERFnet's own backbone network.

"The point-to-point [in our backbone] will go away as we move to fast-packet, public services like SMDS, frame relay and ATM," said Pushpendra Mohta, director of engineering at CERFnet. "Internet service providers want to provide value-added services, not run large backbones," he said, adding that the phone company service is attractive also because of its built-in redundancy.

A second advantage of SMDS is that it gives customers the option to choose a continuous range of bandwidth. Previously, users had to select between 56K bit/sec., T1 or T3 access lines.

CERFnet adopted SMDS in 1992 with a four-site test bed. The company, which provides Internet access to more than 300 organizations, has 25 SMDS sites installed and 50 planned by the end of the year.

In addition to SMDS, CERFnet uses frame-relay technology (as a sub T1 interface) and will deploy its first Asynchronous Transfer Mode interface in August.

RSA and Enterprise Integration Technologies team up to boost electronic commerce security

By Gary H. Anthes

RSA Data Security, Inc. and Enterprise Integration Technologies Corp. (EIT) have joined forces to create products that enable secure commerce on the Internet.

RSA in Redwood City, Calif., and EIT in Palo Alto, Calif., have formed a new company, Terisa Systems, to provide tool kits and consulting to developers of applications for the World Wide Web (WWW) and Mosaic.

WWW is an Internet tool that facilitates access to distributed multimedia information. Mosaic, developed by the National Center for Supercomputer Applications at the University of Illinois, works with the WWW to browse the Internet, offering point-and-click access to multimedia information.

A significant step

"The Internet has been evolving quickly as a medium where businesses can interact, but it is weak in key areas such as security," said John Young, chairman of Smart Valley, Inc. "Terisa Systems is taking a significant step forward in enabling electronic commerce by providing a standard security implementation for software developers."

Initially Terisa Systems will develop tool kits to support the development of secure WWW clients and servers. The kits will offer user authentication, authorization and encryption.

Privacy through encryption

The products will be based on RSA's technology for public key cryptography, which provides privacy through encryption and authentication via digital signatures, and EIT's Secure HyperText Transfer Protocol (HTTP), a security-enhanced version of the WWW's internal communications protocol.

According to the companies, an application based on Secure HTTP allows users to affix digital signatures that cannot be repudiated, permitting digital contracts that are legally binding and auditable. In addition, the technology will allow sensitive information such as credit-card numbers and bid amounts to be encrypted and safely transmitted.

Terisa Systems said it will have tool kits to support development of secure WWW client and server applications in the fourth quarter.

Commentary

Tim Grantham

Videoconferences of doubtful value

In early 1991, Gartner Group predicted that the videoconferencing market would reach near commodity status by 1994. Well, it's 1994, but the only place videoconferencing appears to have found widespread use is in booths at trade shows.

The benefits of videoconferencing seem obvious, at first. After all, aside from a few shy souls, who wouldn't want to see, as well as hear, the people we communicate with every day? "It's a no-brainer," as one senior communications industry analyst once declared to me. "As soon as one senior executive sees that another has it, he'll have to have it, too."

And then there's the argument that says videoconferencing reduces travel expenses. After all, paying a public carrier a few hundred dollars or so to conduct an important meeting with colleagues on the other side of the country via video is a lot less expensive than plane tickets, accommodations, meals and so on, not to mention work time lost due to travel.

It sounds great until you take a hard look at the technical issues, the real costs and the alternatives. Then it begins to look like videoconferencing will have the same happy future as 3-D movies.

Consider desktop videoconferencing over a LAN. It requires fitting each computer with a camera, speaker, microphone, video coder/decoder board and videoconferencing software, in addition to the hardware and software for the computer to act as a network node.

This isn't cheap. The ProShare Video System 200 product from Intel, for example, costs about $2,000 per node. That figure will certainly decline over time, especially once PC vendors begin to integrate video technology at the system board level, as Apple has done. But that is only half the story. You will also have to spend a lot of money to upgrade your network to handle videoconferencing traffic.

It looks like videoconferencing will have the same happy future as 3-D movies.

In theory, Ethernet is rated at 10M bit/sec.; in practice; however, it provides only about 5M bit/sec. of throughput — enough for about five simultaneous, two-way, full-screen videoconferences, using the best compression algorithms, with nothing left over for regular data traffic. This presumes that users will be happy with the less-than-broadcast quality of the video images, the constantly saturated bandwidth on the LAN, echoes and feedback in the audio and the generally poor quality (for video purposes) of most office lighting.

Just solving the bandwidth limitations, such as upgrading the LAN to 100M bit/sec., will add between $1,500 and $4,000 to the cost of the node to pay for the new network adapter and a port on a collapsed backbone hub. You might even have to add the cost of pulling fiber-optic cable to the desktop.

These costs are just for a LAN at one site. If you want to conduct videoconferencing over a wide-area network, be prepared to cough up for a bunch of T1 lines.

Clearly, desktop videoconferencing will cost a lot of money, which might be worthwhile for some customers if it really added value to their business communications. But it doesn't.

No value because...

First of all, most of the task-oriented information exchanged at a meeting is communicated verbally, not gesturally. Almost all the rest is exchanged in paper or electronic format. Only the information conveyed through gesture requires being able to see the participants. The verbal, paper-based and disk-based information is easily exchanged through low-cost mechanisms already largely in place: telephones, fax machines and E-mail.

Some would argue that body language conveys important information about the emotional state of the speaker. I say that most people can pick up that information from the speaker's voice— its timbre, pitch, articulation, pace and pausing tells listeners all they need to know about the speaker's attitude, about him or the subject under discussion.

Videoconferencing may only become ubiquitous once it is virtually free. But if that day comes, you can bet you'll hear users longing for the days when they could scan their mail without letting that boring customer on the line know he had less than their fullest attention.

Grantham is a writer based in Paris, Ontario.

New Products

Integro Advanced Computer Systems, Inc. has announced TalkRemote 2.0, an enterprisewide control and assistance product.

According to the Lawrence, Mass., company, TalkRemote 2.0 supports a large number of LANs and wide-area networks and lets administrators control and assist user workstations over the network.

The product includes comprehensive recording and playback, the ability to move files between the administrator and user, password security and the ability to handle a system with up to 4,000 users.

Four remote control and assistance modes exist for the administrator: SnapShot, Observation, Shared Control and Complete Control.

Prices range from $1,240 to $72,150 on a per-administrator and per-user basis.

▶ *Integro Advanced Computer Systems*
(508) 687-4454

Informer Data Security, Inc. has announced the Secure Access Management (SAM) system, a nonproprietary remote access management and control system that supports industry standards and controller cards.

According to the Garden Grove, Calif., company, SAM is a dial-back security system with an architecture that isolates incoming phone lines from the host and ensures that no connection is made with the system before a remote user's access authorization is verified.

The product, which runs on PCs, works with Hayes Microcomputer Products, Inc.'s Millennium 8000 modem technology and supports an unlimited number of lines distributed across a communications network.

Prices ranges from $400 to $600 per line.

▶ *Informer Data Security*
(714) 379-4480

Momentum Systems Ltd. has announced the Intelligent Network Gateway, a distributed, automated gateway for management of all external communications.

According to the Moorestown, N.J., company, the product supports three concurrent categories of data transfer: traditional store and forward batch, flow-through for time-sensitive files and request response communications.

The gateway manages traffic among many remote end points, with a variety of protocols and a single- or multiple-host processing environment. It also allows special handling and routing, depending on data content.

Pricing starts at $50,000.

▶ *Momentum Systems*
(609) 727-0777

Armon Networking, Inc. has introduced OnSite, a network management product line that provides real-time LAN monitoring and analysis information on Ethernet and Token Ring networks.

According to the Camarillo, Calif., company, OnSite implements the U.S. Remote Monitoring Management Information Base standard, operates as an independent, central network management system and interoperates with other hardware- and software-based systems.

OnSite features a learning tool application that automatically baselines network characteristics per segment and sets alarm thresholds.

Prices range from $1,000 to $9,000.

▶ *Armon Networking*
(805) 388-5566

NovaLink Technologies, Inc. has announced the NovaPak 144, a PCMCIA Type II card that combines a wireless alphanumeric receiver with a high-speed 14.4K byte/sec. modem.

According to the Fremont, Calif., company, the NovaPak 144 enables multiple mailboxes, private outgoing messages and remote message retrieval. It also features error correction, data compression and enhanced data throughput.

The NovaPak 144 identifies incoming calls as voice, data or fax and handles them appropriately.

The product costs $449.

▶ *NovaLink Technologies*
(510) 249-9777

Leibert Corp. has introduced DataPad, a self-contained system that integrates uninterruptable power supplies, power distribution, air-conditioning and communications.

According to the Columbus, Ohio, company, the product is configured as a self-contained platform and consists of a variety of modules to match current and future growth requirements.

Each module is made up of a steel support structure and can be configured with any combination of modules to match a variety of floor plans and protection requirements.

Prices range from $26,000 to $33,000, depending on configuration and options.

▶ *Leibert*
(614) 888-0246

Product shorts

Cardiff Software, Inc. has introduced Teleform for Windows Version 3.0, fax- and scanner-based forms recognition software. The product provides improved handprint recognition, a Designer module for forms creation and BasicScript, a language for implementing complex procedures. Cost: $1,495. Cardiff Software, Solana Beach, Calif. (619) 259-6444.... **Frontier Technologies Corp.** has introduced SuperHighway Access, software featuring multimedia electronic mail, file transfer, a network news reader, terminal emulation and a Talk protocol. SuperHighway Access includes anonymous search and receive capabilities, hierarchical browsing, database searches and hypertext links. Cost: $149. Frontier Technologies, Mequon, Wis. (414) 241-4555.... **Boca Research, Inc.** has announced the BocaLANcard Combo (twisted-pair and coaxial) and the BocaLANcard TP (twisted-pair) XT/AT bus Ethernet interface cards. The cards feature bus master technology for faster data transfers; Intel Corp. plug-and-play capability and programmable diagnostic; and link status LEDs for self-testing and monitoring of network activity. Cost: BocaLANcard Combo costs $89; BocaLANcard TP costs $79. Boca Research, Boca Raton, Fla. (407) 997-6227.

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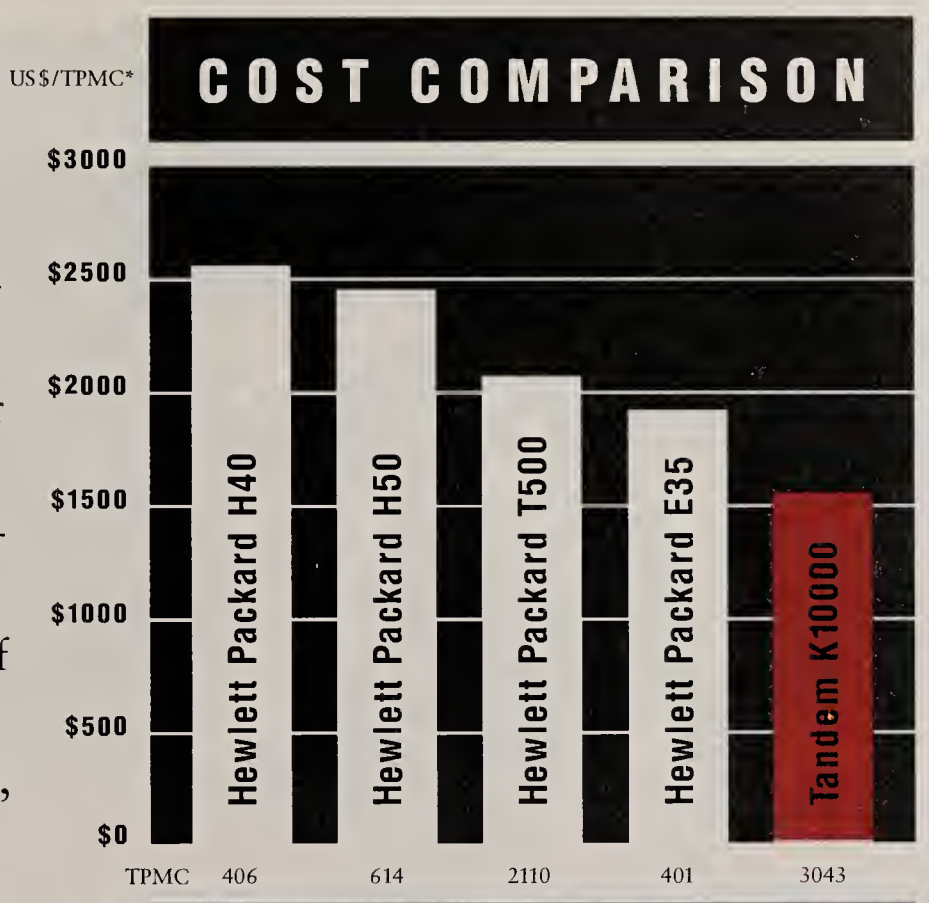

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–Peter Kastner, Vice President
The Aberdeen Group

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Mainframe prices take slower way down

By Craig Stedman

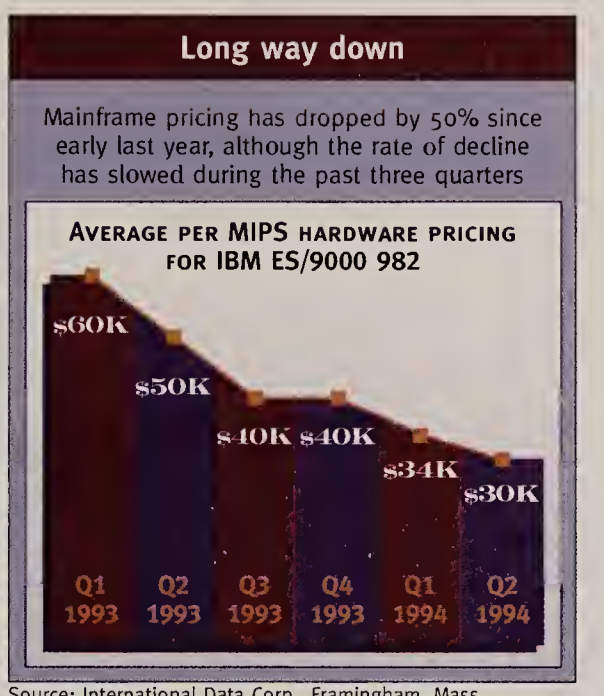
IBM has been as good as its word on mainframe pricing. Jerome York, IBM's chief financial officer, said in April that a moderating trend in the downward price spiral would likely continue through this quarter, and users and analysts say actual prices bear out his prediction.

While the cost of emitter-coupled logic-based mainframe hardware is still on an inexorable decline, the rate of the drop-off has been relatively gentlemanly since late last year. This is because production constraints have kept IBM from fully meeting a surge in demand for its ES/9000 systems (see chart).

IBM's prices have been close to level during the past three to six months — $30,000 to $35,000 per MIPS for new mainframes, said Paul Quade, director of capital planning and resource management at Galileo International, an on-line reservation company in Englewood, Colo.

The lack of a bountiful supply from IBM also appears to have firmed up prices for used mainframes and made those systems harder to find, Quade added. "I think a lot of the customer base went to the used market and picked up what they could find," he said. "That's dried up the supply out there."

Susan Middleton, a senior analyst at International Data Corp. in Framingham, Mass., agreed that there is only "very limited availability" of newer ES/9000 systems such as the eight-way Model 982 in the used market. IBM's production shortfall "is not a bad problem to have," Middleton said. "It's better than having to try to convince people to buy your products."



Source: International Data Corp., Framingham, Mass.

The easing of the price free fall has also benefited plug-compatible mainframe vendors. "Our pricing is going to track IBM's," said William Tudor, director of processor systems marketing at Hitachi Data Systems Corp. in Santa Clara, Calif.

As a result, HDS was able to come in above plan on profits during the second half of its fiscal year, which ended in March, Tudor noted. "We had assumed that we would have to be selling at even lower prices than we were toward the end of the half," he said.

IBM's production of ES/9000s is expected to remain constricted until August [CW, April 25]. But once the supply crunch abates, prices should start moving down at a more rapid clip in the late third and fourth quarters, according to Middleton.

"I think that by the end of the year, you'll see a price of under $25,000 a MIPS from IBM" on water-cooled ES/9000s, Middleton said. HDS and Amdahl Corp. went below the $25,000 mark this quarter on average selling price and could be down in the $20,000-per-MIPS range by the fourth quarter, she added.

Further reductions are needed to make mainframe pricing more compelling compared with client/server alternatives, said Mark Van Horn, manager of technical services at Pierce County Medical Bureau, Inc., a Blue Shield insurance provider in Tacoma, Wash.

Pierce County Medical wants to avoid any more mainframe upgrades and plans to implement a new managed care application on a Digital Equipment Corp. DEC 2100 server running the OSF/1 operating system, Van Horn said. The DEC 2100 and a third-party application package will cost about $400,000, while the company would have paid more than $1 million for a new mainframe and a replacement of its IBM 3380 disk subsystems, he added.

Times change

"There definitely is a monetary savings there," Van Horn said. "We looked at [Unix] last year, and it wasn't as practical as it is now because the applications weren't available. We would have had to do it ourselves, and now we don't have to. That ... made the difference for us."

While client/server platforms still lack the technical muscle of mainframes, pricing on both traditional ES/9000s and IBM's new CMOS-based parallel System/390 machines [CW, June 6] has to keep going down at a steady clip to be more competitive, agreed Charlie Burns, a research director at Gartner Group, Inc., a consultancy in Stamford, Conn.

"IBM's real competition isn't with the other mainframe vendors," Burns noted. "The real competition is with workstations and alternative platforms."

CW Guide to Mainframes. See page 115.

Big users yearn for global software management

By Thomas Hoffman

In the past few years, ABB Asea Brown Boveri Ltd. has purchased more than 5,000 copies of Lotus Development Corp.'s Notes groupware to help engineers communicate across its 1,300 worldwide divisions. But because Lotus sells its software only through resellers, the Swedish/Swiss-owned engineering conglomerate has been forced to pay a $30 per-user surcharge to reseller IBM to distribute the workgroup packages on a local basis.

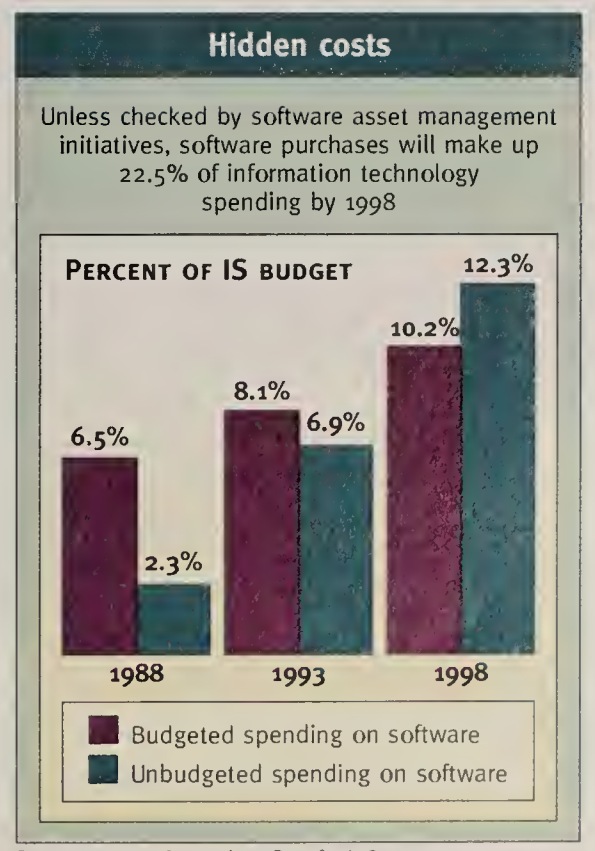
Problem is, the additional $150,000 ABB has shelled out for Notes has not brought it any value-added services, a shortcoming that has drawn the ire of at least one ABB information systems executive. "Regardless of who we buy it from, I'd like some added value," said Patrick B. Carney, director of IS at ABB Power Generation, Inc. in North Brunswick, N.J. "With our current arrangement [with IBM], that's not happening at all."

Carney's complaints echo similar concerns being raised on the software licensing front. As customers continue to place increasing reliance on desktop applications to perform mission-critical operations for their firms, desktop software vendors are being asked to take a more global view of their clients' enterprise software requirements — as have their counterparts on the mainframe software side.

Vendors listen

In the past two years, Computer Associates International, Inc., IBM and Legent Corp., among others, have heeded their customers' cries for more kinds of licensing choices. Now users want those kinds of options on the desktop side.

Unfortunately, most desktop vendors are still mired in the shrink-wrapped sales mind-set. "Most desktop software vendors don't seem to understand the needs of their very large customers," noted Karen Cone, a research director at Gartner Group, Inc.'s software asset management service in Stamford, Conn.



Source: Gartner Group, Inc., Stamford, Conn.

Some of the industry's biggest customers are meeting these issues head-on. IS executives from 10 Fortune 100 firms met earlier this month with a Microsoft Corp. liaison to voice concerns about shortcomings in the Microsoft Select program. Most desktop publishers "are not used to dealing with customers on a global basis, so their programs are not really in sync with our needs," said Alison Buchanan, an assistant vice president of contract and vendor management at Bankers Trust Corp. in New York. Buchanan represented the financial services giant at the recent Microsoft meeting.

Paying through the nose

Bill McNee, vice president and service director of Gartner's software asset management service, spoke at a recent seminar about a large corporate customer that was paying 150% of an enterprise desktop license plus a premium for each concurrent user — just to make sure it was in accord with the vendor's contract.

Buchanan said the recent Microsoft roundtable was designed to avoid such desktop licensing snafus. "We're trying to find ways to best price desktop software on a global basis so that we're not overlicensing ourselves but not out of compliance with the right

Big users, *page 92*

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Schwab payroll goes client/server

By Rosemary Cafasso

When the 6,000-plus employees at Charles Schwab & Co. receive their paychecks these days, they owe it to the new client/server system chugging away in the back room.

Schwab's recent conversion from a mainframe-based payroll system to a client/server package from Powerpay Software, Inc. reflects a growing trend among client/server users: moving beyond the decision-support class of applications to the real bread-and-butter systems.

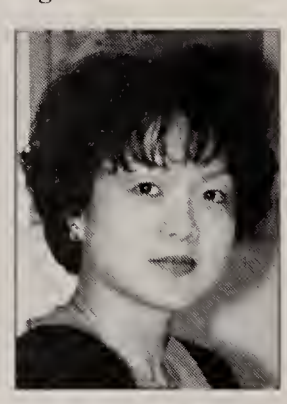
Typically, payroll "has not been the lead client/server application," said Claire Gillan, director of applications research at International Data Corp. in Framingham, Mass. "Payroll is definitely mission-critical, so it is typically not what people want to start off with."

But today, companies such as Schwab are versed enough in client/server to take the plunge with a core application. Powerpay Software, a start-up in Rockville, Md., estimated it has 35 customers running its payroll system.

Another example comes from PeopleSoft, Inc., one of the top client/server human resources software companies. Last week, PeopleSoft estimated that 75 of its 154 human resources customers in production mode run payroll applications as well.

To minimize payroll migration risks, Schwab tested the Powerpay software for several months after selecting it last year. The company then ran it in tandem with its old mainframe system for three months before letting it fly solo, said Marina Miller, director of corporate support services.

"We realized there was an element of risk, but it was a calculated business risk," Miller said. "We had the [chief operating officer] and the [chief information officer] participating in this, so it was not a tough sell."



The business risk *of moving payroll to client/server is paying off, Schwab's Marina Miller says*

So far, the risk is paying off. Schwab has been depending on the Powerpay system since April and finds it "very reliable," Miller said.

Tangible benefits

The system has cut Schwab's payroll costs by 30% to 40% per paycheck. Miller would not release exact numbers but said the per-check cost is a "fully loaded" number, representing savings in payroll processing, personnel and systems maintenance.

Despite these gains, Schwab continues to work with Powerpay to fine-tune the system, said Mary Bowers, director of human resources information systems at Schwab. While the new system saves processing time by eliminating daily batch jobs performed on the old system, it takes more time to run the twice-monthly payroll.

"The back end is taking a little longer now, but we are working with the vendor and looking at different ways to process," Bowers said.

Pentium setup

The new payroll system runs on six Intel Corp. Pentium-based machines. The lineup includes a file server and a hot backup that mirrors the file server because of the critical nature of payroll, Bowers said. The other four machines are designated computational servers or the back-room number crunchers.

Most of the processing, including payroll calculations, is shared among the four Pentium-based systems. The current exception is the payroll run, which is configured as a sequential batch job in the Powerpay environment. Payroll cannot be split up across the four CPUs, which is one reason why the client/server system takes longer to run than the system it replaced.

For Schwab, the migration to a client/server payroll system was in large part about meeting key goals, according to Miller.

First, the migration dovetailed with a Schwab corporate goal to off-load applications from mainframe systems to client/server platforms wherever it made sense.

Second was the cost savings. In addition to the per-check savings, Miller said Schwab saves on personnel costs. It has moved from two to three mainframe programmers to between one and two client/server programmers.

The third goal was to gain more flexibility for the payroll system. The older mainframe software, developed by a vendor Miller would not identify, could not accommodate typical changes that must be made in the payroll process.

As a result, tasks outside of the normal payroll processing had to be entered manually. Retroactive payments had to be manually calculated and input for a specific payroll run. In comparison, the new system automatically tracks changes, makes the calculations and adjusts the paychecks.

Commentary

Ted Krum

HP/Intel: FUD for thought

Hewlett-Packard and Intel have announced plans to cooperate on the development of a new microprocessor family. Their major goals for the new chips, probably due no earlier than 1998, are to achieve significant performance advantages over competing architectures while providing native, binary compatibility with both companies' existing processor lines.

These highly aggressive technical goals may appear very risky, but the Apple/IBM/Motorola alliance is far riskier. Failure in that case would consign Apple and Motorola to the dustbin of desktop history and severely restrict Power architecture volumes for IBM.

In contrast, Intel still owns 90% of the PC market, while HP remains the only broadline systems vendor whose star is still rising. (HP also retains the option of porting Windows to its existing 7100LC chip.)

Both companies have made it clear that they are committing little more than resources already on hand. While failure would be unfortunate, both could afford to pick up their marbles and go home, having learned some valuable technical lessons from each other.

An HP/Intel alliance increases risk for IBM, Digital and other systems vendors working on x86 alternatives because they can no longer turn back. If they fail to wrest market leadership from Intel, their profitable PC businesses will effectively have to start paying royalties to HP, their strongest rival in most other sectors.

The biggest losers, though, are the second-tier vendors for whom Intel was the last great technology provider that did not compete broadly against its customers. Lacking the resources to design their own CPUs, they will now have to pay at least one competitor no matter where they turn.

Answers forthcoming

In some respects, it does not matter whether HP and Intel attain their ambitious goals by 1998 because the marketplace will have resolved many critical questions by then.

We will have had four years to find out, for example, whether corporate customers will be willing to accept nonclone x86 alternatives at all. Apple will have succeeded or failed, which will determine whether the PowerPC is commercially viable as a high-volume architecture. Windows NT will either have supplanted nonportable versions of Windows on the desktop or not, thereby settling the desktop destiny of the Mips Technologies and Digital Alpha architectures, which offer neither binary compatibility nor Intel emulation.

Intel and HP have made moot the issue of RISC vs. CISC — that is, whether designers should fill their chips with things that make them go fast or things that make them easy to program. RISC clearly holds better long-term performance potential, but performance is only half the answer. The marketplace is littered with fast chips that almost nobody is willing to buy. CISC makes chips easier to program, but outside the embedded control market, chip-level code is written by compilers, not people.

Sales proof

Intel and HP are implying that the best thing designers can put on their chips is simply whatever helps sell the most chips. Judging from the market, what sells best is software compatibility.

PC buyers should be reassured by these developments, not alarmed. Most major vendors have by now conceded that the x86/Microsoft architecture, which has served us so well for more than a decade, will be with us in several forms for another 10 to 15 years. The issue for today is how compatibility with this architecture can best be implemented at the various price/performance points across the range of market requirements. My bet is that, especially with HP's help, Intel has a better handle on this problem than anyone else.

Krum is a senior research analyst at RCB International in Stamford, Conn. His E-mail address is Tedkrum@aol.com.

Big users

CONTINUED FROM PAGE 89

to use," Buchanan said.

McNee said the advent of electronic software libraries should help larger organizations keep track of their voluminous desktop resources.

But while early providers such as Gradient Technologies, Inc. and Brightwork Development, Inc. have already begun marketing technical licensing managers, most prospective customers said the systems are not yet all-inclusive.

For example, The Chase Manhattan Bank NA has tested several electronic software libraries to manage its global software packages but has not found a single package designed to administer the bank's immense software cache, according to Eugene H. Friedman, vice president of applied technology at Chase.

"All of the individual features have been met. The problem is packaging them all into one coherent product," said Friedman, who also sits on the software asset management committee at the Open User Recommended Solutions Group, an industry consortium dedicated to solving key distributed systems issues.

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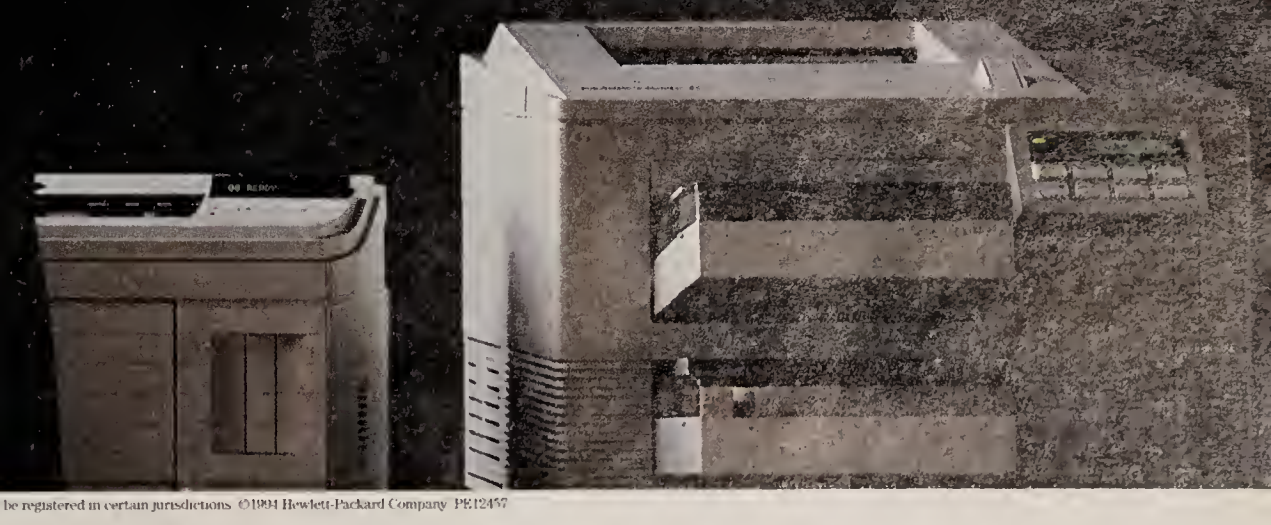

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BUILDING
VALUE
FOR THE
CUSTOMER
A three-part series

INFORMATION IS THE SOURCE

"VALUE TO CUSTOMERS MEANS UNDERSTANDING THEIR BUSINESS, MEETING THEIR EXPECTATIONS, AND ABOVE ALL, HELPING THEM INCREASE COMPETITIVENESS."

Hank Holland
President
Dun & Bradstreet Software

While most vendors in this industry see themselves as technology or service companies, for Dun & Bradstreet Software these are the intermediate steps. D&B Software views the key issue as information: how to give its customers timely, reliable and relevant information. The company's client/server solution, the SmartStream® Series (including SmartStream Decision Support, Financial Stream, HR Stream, Manufacturing Stream and Distribution Stream*) provides enterprise-wide technology that helps customers turn information into better decisions — decisions that drive customer profitability and competitiveness.

"What distinguishes our company as a strategic supplier is our unique ability to combine business information and technology to facilitate the best possible decision," says Hank Holland, president of D&B Software. "We provide the technology that allows quick, easy access to the accurate information that drives decisions."

MOVING UP THE DECISION VALUE CHAIN

D&B Software's unique position grew out of the 1990 merger of Management Science America and McCormack & Dodge, two companies with over 50 years of combined experience and proven expertise in providing 40,000 transaction-oriented business solutions to over 10,000 customer sites. To this background in technology and customer service, D&B Software adds the 150 years of experience of its parent, The Dun & Bradstreet Corporation.

With over $4.7 billion in revenue, D&B is the world's largest provider of value-added business information, software and decision support services. The company's overall mission is to make information available, convenient and useful to its thousands of customers around the globe.

D&B companies include Moody's Investors Service, A.C. Nielsen, Reuben H. Donnelly, IMS International and Dun & Bradstreet Information Services, all of which provide businesses with *external* information crucial to their success, such as credit reporting and market analyses. D&B Software helps customers gain value from their *internal* information. Just as a company like A.C. Nielsen turns field surveys into competitive marketing information, D&B Software's solutions let customers turn basic business transactions into meaningful input for decision-making.

"Our position as part of The Dun & Bradstreet Corporation gives our customers an unparalleled opportunity to leverage both internal and external information," says Holland. The SmartStream Series provides the integrating platform — the place where customers can analyze business information from all sources. It is a process the company calls "moving up the decision value chain," the path from raw data to valuable knowledge.

By all measures, D&B Software finds that this approach is working for its customers. The company has the highest customer-retention rate in the industry, with over 90 percent. D&B Software has also been cited by a leading industry publication for outstanding service and support three years in a row. Over 60 percent of D&B Software's customers have said that the company is strategic to the success of their businesses. "We have received this recognition because of the methodologies and processes that we have put in place," says Holland. "That work is paying off for our customers."

For example, Weyerhaeuser, the $9 billion forest-products company, recently chose D&B Software's HR Stream to integrate information about its 40,000 employees that was spread among human resources personnel at 100 locations. The business problems they faced were poor access to enterprise-wide information, and a lack of standardized definitions and technology around data for human resources applications. HR Stream, running over a client/server network, provided the answer. "It gives us wide accessibility to our human resources data across the company and enhances our ability for making sound business decisions," says Cliff Hall, vice president, Information Technology, Weyerhaeuser.

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Cliff Hall
V.P.
Information Technology
Weyerhaeuser

STRATEGIES FOR THE CUSTOMER

While these successes are due in large part to the technology and service expertise D&B Software brings to the market, they are also the result of simply "practicing what you preach." At its inception, D&B Software started with a clean slate, combining the internal information about its capabilities with the external information about what its customers needed from technology solutions.

D&B Software's own use of integrated information for decision-making led to the creation of a strategy that directly addresses customer requirements. The company found that its core competencies answered four key customer needs: information access for decision-making, flexible systems that adapt to business process change, enterprise-wide data integration and open technology choices.

These four needs became the driving forces behind D&B Software's new class of business solutions, the SmartStream client/server platform. The company designed this product line to give customers:

- A transaction-processing solution that efficiently gathers internal business information, combined with the decision-support tools that make the information more effective;
- Technology based on the workflow among real users, real data and real processes, providing the means for customers to improve business processes to suit their individual needs;
- An integrated system for handling all the information generated and used by a business, rather than traditional applications built for separate departments and functions;
- An open technical architecture that lets customers implement the approach that matches their resources and needs, from comprehensive client/server distributed applications to add-on tools for mainframe transaction systems.

Says Holland: "Finding the best answers to our customers' questions keeps D&B Software in a leadership position. But we just don't sit back and wait for the questions to be asked. We work continually to improve the products and services that add value to our customers' businesses."

For more information about D&B Software solutions, call 1-800-290-7374.

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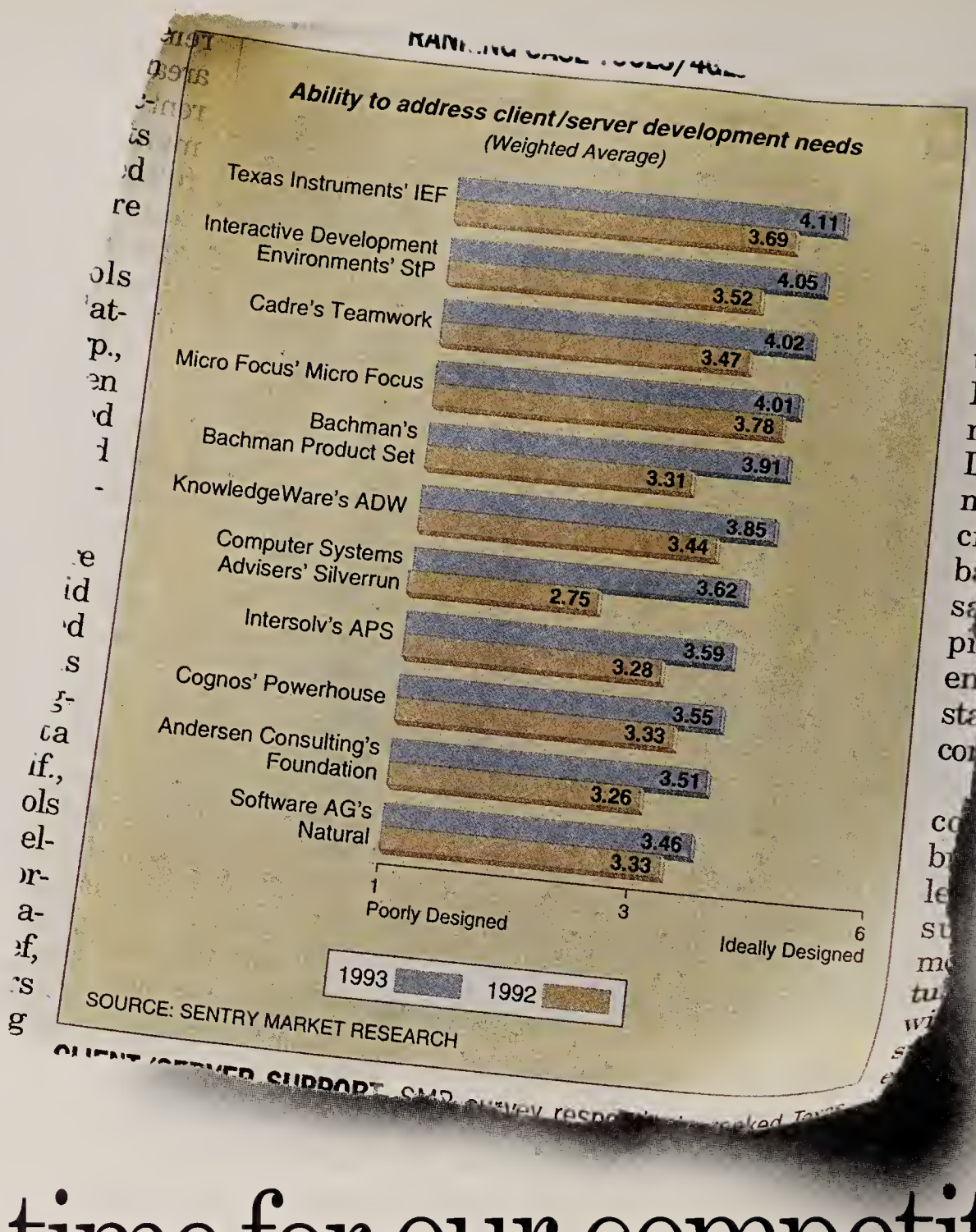

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TEXAS INSTRUMENTS

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New Products

Apertus Technologies, Inc. has announced Express Data Transfer Services with local-area transport (LAT) connectivity, a cross-platform, program-to-program product for communications among Unix, VAX, IBM mainframe and AS/400 systems.

According to the Eden Prairie, Minn., company, LAT connectivity permits VAX terminals using native mode 3270 and 5250 emulation to log in directly to an IBM host.

Express Data Transfer also includes native mode 5250 emulation, providing VAX terminals with full support for 5250 data stream field attributes.

Express Data Transfer Services costs $8,000.

▶ *Apertus Technologies*
(612) 828-0300

IBM has introduced the Data Replication family of products: DataPropagator Relational Version 1, DataPropagator Non-Relational Version 2 and DataRefresher Version 1.

According to the company, the products were designed to deliver data across the enterprise, from mainframes to workstations.

Data Replication products can automatically copy data to the appropriate targets, whether the data resides on the host or the workstation.

Prices range from $1,295 to $93,840.

▶ *IBM*
(914) 765-1900

Star Technologies, Inc. has announced the StarPentium/SMP-XM symmetrical multiprocessor.

According to the Laguna Hills, Calif., company, the product supports up to six Intel Corp. 60-MHz Pentium CPUs and provides a binary-compatible upgrade path from a single PC to a 350-plus port system.

The StarPentium/SMP-XM includes 256M bytes of memory on a single card and runs existing I/O drivers unchanged.

The StarPentium/SMP-XM costs $22,000.

▶ *Star Technologies*
(714) 768-6460

Human Designed Systems, Inc. has announced the HDS ViewStation TR series, a line of X terminals designed to interoperate seamlessly in IBM RS/6000 and mainframe environments.

According to the King of Prussia, Pa., company, the X terminals can connect to Token Ring, Ethernet and Point-to-Point Protocol networks simultaneously. Also, they act as network routers and provide a full set of local X applications.

Users can port their own applications to run locally on the X terminal to reduce host load and network traffic.

Prices range from $1,399 to $3,699.

▶ *Human Designed Systems*
(610) 277-8300

Zitel Corp. has announced the ZDC subsystem, a data management subsystem designed to enhance system performance by off-loading back-end Oracle database processing from VAX hosts.

According to the Fremont, Calif., company, ZDC provides enhanced I/O performance with existing host and database resources; users do not have to develop new distributed application code for the database front ends or the host-based back-end engine.

ZDC incorporates an Intel Corp. Pentium processor running SQLnet server software and comes in two configurations: ZDC-1 for deskside VAX stations and ZDC-2 for larger VAX data center systems.

Both configurations integrate a high-capacity cache with unique caching algorithms and a single high-speed disk.

Prices start at $48,000.

▶ *Zitel*
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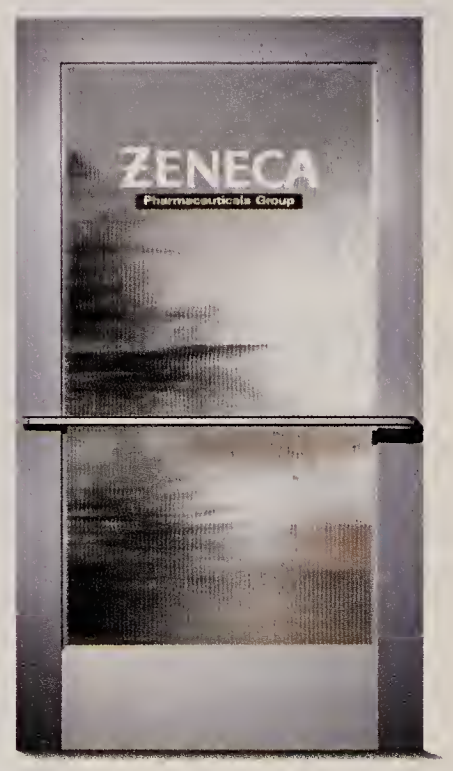
Since Lante Corporation created a sales toolbox using Microsoft Office and Visual Basic, sales have increased 128%.

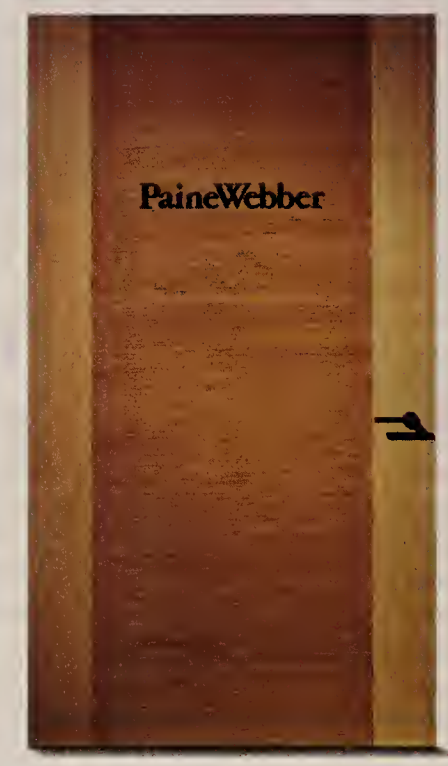
Wonderware Corp. created a Microsoft Windows™-based control system at one-fourth the cost of a typical configuration.

Gateway Group, Inc. helped integrate Microsoft SQL Server into an image-based billing system, dramatically improving productivity.

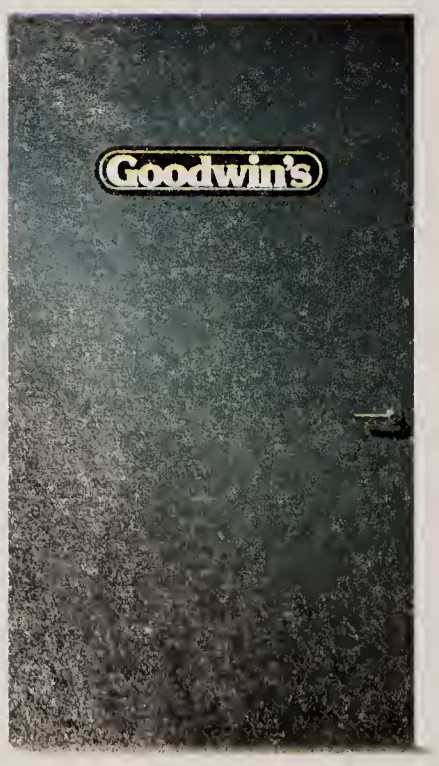
Microsoft Office and WinResources Computing, Inc. made changing menus faster and easier for this popular restaurant chain.



MDL Information Systems, Inc. and Microsoft Office provided productivity tools allowing research scientists to better analyze data.



This securities firm looked to Micro Modeling Associates and Microsoft Office to expedite the delivery of investment research to clients.



MTX International, Inc. and Stanford Business Systems joined this supermarket's accounting and point of sale system with Microsoft Access.

Platinum Software and Paradigm Technologies implemented a Windows NT™-based client/server architecture, cutting costs 65%.

This law firm now spends less time on paperwork thanks to Quickstart Technologies' use of Microsoft Office and the Windows NT family.

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How to Unravel the Client/Server Mystique.

First, accept that there is no mystique. Rather, there are hordes of slightly frantic software companies content to have you believe that effective open system solutions remain elusive while they rush to understand, develop, and market their interpretation of client/server. Then there's Lawson Software.

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The truth is, client/server takes on a special meaning for each individual business computing environment. That's why we've structured our client/server solution as a comprehensive 3-tier architecture, delivering you maximum flexibility in hardware, database and user interface. It's why Lawson's products run across platforms like the AS/400 as well as UNIX systems such as the RS/6000 and HP9000. And it's also why we feature seamless support for a variety of leading databases. In short, we offer options that allow you to make the decisions. Based on your existing hardware configurations and your plans for future development, you choose to place the components of client/server where they will deliver the greatest value and performance.

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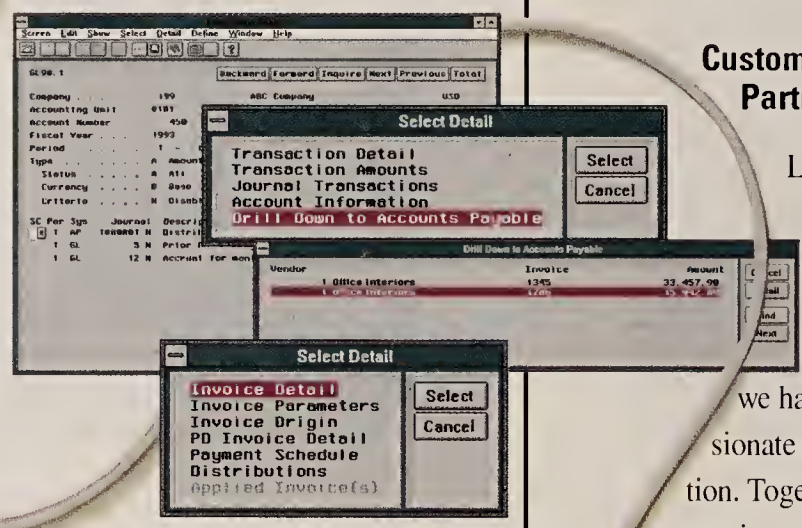

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Lawson Software has always been focused on leading edge technology. And we have always been passionate about client satisfaction. Together, these two commitments have resulted in truly flexible business solutions created with your needs in mind. We'd like the chance to demonstrate this to you. You'll see how – from our system architecture to our award winning client services – Lawson Software really does unravel the client/server mystique.

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Object-oriented systems offer rewards

By Melinda-Carol Ballou

To effectively make the shift to object-oriented programming, developers must work hand in glove with their business end users, according to information systems professionals who have made the transition. Other factors include training, mentors to help with the shift and both smaller groups of programmers and smaller applications.

"We lock [business] clients and [IS] staffers in a room, give them supper under the door and don't let them out until they generate the application requirements," said Greg McDonald, a tools consultant at Home Savings of America FSB in Irwindale, Calif., during a presentation at the Intersolv, Inc. users conference earlier this month.

As an example, McDonald cited one company's attempt to move its legacy Cobol code to an object-oriented environment. The project was unsuccessful due to a combination of factors such as lack of knowledge and training, as well as not enough coordination and planning between the business and IS groups, McDonald said. The expected time frame for the project was 18 months, and the cost was pegged at $2 million. The shelved project cost around $10 million over a period of two years, he said.

Worth the effort

The advantages of shifting to object-oriented environments from legacy systems — on which companies have spent more than $1 trillion over the past 40 years — are well worth it, according to Colin Crook, senior technology officer at Citibank NA in New York.

Crook, who made his comments during an address at the Object Expo conference in New York earlier this month, said the old systems "contain and render immutable the old ad hoc, non-value-producing business processes."

The "real world" is also changing, more so in the 1990s than previously, and the models on which applications are based must be able to adapt dynamically, Crook said.

Object-oriented development techniques can offer businesses such a model but only if a tight partnership exists between business and technology people.

Object-oriented technology "holds out the promise" of achieving the ends that both IS and business users want, "but each stage of development must be constantly iterated," Crook said. In other words, developers must use business clients as touchstones to which they continually return throughout the design and development process. If they do not do so, the application will cease to represent business needs and processes and the advantage will be lost.

Effective applications

Other developers at the Object Expo conference agreed with the need for object-oriented applications that effectively incorporate business needs and processes.

"Business policies change, so we needed a methodology that let us deal flexibly with that," said Blayne Maring, area vice president of architecture at GTE Telephone Operations in Irving, Texas, at an Object Expo briefing sponsored by Andersen Consulting.

Maring and others emphasized the advantages of object-oriented development in terms of ease of maintenance due to encapsulation and increased productivity from code reusability, although the early projects are difficult and costly.

"Our first project took us 20% longer; later projects took us 20% less time. Productivity goes up and up," said Elizabeth Flanagan, manager of network applications information services at Home Box Office, a Time Warner company in New York.

But managers should not expect such productivity increases immediately. Making the transition is arduous, and reusing code involves careful planning. Crook emphasized that object-oriented techniques are unstable and evolving. Key vendors are involved in a "massive fight to make money. It is unclear [for instance] what Microsoft is going to do in relation to other companies."

Making the shift

Some questions to ask when shifting from legacy systems to object-oriented environments:

- How do we want to operate?
- How do we currently operate?
- Why should we change?
- What are the expected benefits?
- What are the risks of the status quo?
- Will the business need to change?
- What is the implementation strategy?
- How do we get there from here?

SOURCE: HOME SAVINGS OF AMERICA FSB

Gupta announces tools and database upgrades

By Kim S. Nash
PALM SPRINGS, CALIF.

■ Gupta Corp. laid out an object-oriented future at its recent user group conference here, unveiling database and tools upgrades and previewing a distinctly CASE-like approach to application development.

The Menlo Park, Calif., firm announced upgrades for its SQLBase database and SQLWindows tools, which are scheduled to ship next month. Gupta also gave conference attendees a sneak peek at enhancements planned for next year.

Promises to support new operating systems and add functionality went over well with many corporate and third-party developers at the conference. Some observers also commended Gupta's grand plans for a soup-to-nuts application development environment that includes a central repository reminiscent of the concepts behind computer-aided software engineering (CASE).

But what sets Gupta apart from the CASE group is its object-oriented spin, said Dan Richards, an analyst at Database Associates in Pleasant Hill, Calif. "Gupta is the one vendor that has managed to have very good object-oriented support without being based on an object-oriented programming language," Richards said. Gupta's products are based on a scripting language called Sal and not on Smalltalk or C++, two popular object languages.

New Gupta tools "go way beyond KnowledgeWare's ObjectView and [Microsoft Corp.'s] Visual Basic, which don't really do true object programming," he said.

Moreover, Gupta envisions an "active repository, not a monolithic one, like IBM proposed with AD/Cycle," said Chief Executive Officer Umang Gupta, referring to an ill-fated development framework extolled and then abandoned by IBM a few years ago.

Buying objects

Although the repository is founded on relational technology, namely Gupta's SQLBase database, it would house user-created objects and those bought in libraries from third-party vendors, officials said. Business and data models will also reside in the repository.

The plan also encompasses competing third-party tools via application programming interfaces and other links between Gupta products and CASE tools, compilers and other programming aids.

"This is a broad change in technology," Gupta said, adding that the company plans to make new object products compatible with existing tools.

On the database side, SQLBase 5.2 is slated to ship for Microsoft's Windows NT and Novell, Inc.'s NetWare 4.0 and 4.1 and UnixWare systems next month. A version for Microsoft's WinPad palmtop operating system is also in the works.

Gupta numbers

SQLWindows tool licenses worldwide:	35,000
Licenses in U.S.:	6,400
Single-user SQLBase database licenses worldwide:	100,000
Multiuser SQLBase database licenses worldwide:	30,000
Products sporting a new "Gupta Powered" brand name:	400
"Gupta Powered" products expected by the end of the year:	1,000

Heavy-duty platforms

Although Gupta vowed that the company would stick to its PC roots, that promise does not preclude moving to more heavy-duty server platforms. For example, a port of SQLBase to NT on Digital Equipment Corp.'s Alpha systems is due out by the end of the year. Support for Sun Microsystems, Inc.'s Solaris operating system is expected early next year.

Gupta also promised server-caliber functionality. New in SQLBase 5.2 are shared cursors, which let several applications use the same cursors, thereby using less memory.

The company whet users' appetites with a preview of SQLBase 6.0, which is expected to ship to beta sites and early users within six months. Plans call for the product to include stored procedures, triggers and distributed transactions — all of which are currently available on popular Unix databases such as those from Oracle Corp. and Sybase, Inc. Similarly, Gupta will get into multiprocessing, starting with support for four- and eight-way machines, officials said.

Commentary

Mitch Betts

Humanize support systems

The wave of the future is to turn ordinary information systems into decision-support systems. After all, the Holy Grail of the computer community is to augment the human intellect, to help people solve complex problems.

But systems designers must pay a lot more attention to the human side of the equation or else those decision-support systems may wind up supporting bad decisions.

I was reminded of this by a study of a prototype system that helps commercial pilots with the very complicated task of en route flight planning. The system lets pilots display various routes and associated factors such as time, fuel, distance and weather conditions.

The pilots loved it. "Being able to zoom in on the route and look at the weather and the projections is nice. It's pretty easy to use. It's got everything you need," one pilot said.

Sounds like a great success story — except the system induced 40% of the pilots to select a poor flight plan. One pilot, for example, selected a path that used up 24% more fuel.

Reasons for errors

What went wrong? According to the study reported in the March 1994 edition of *Human Factors*, the journal of the Human Factors and Ergonomics Society in Santa Monica, Calif., certain design features led to human errors:

- Providing more data is not necessarily better. For example, some pilots looked at weather forecast data rather than the display of actual weather conditions. Others failed to even notice important data about winds. The solution: Select the data to display judiciously and highlight its significance. Maybe add intelligent alerts to ensure that critical data is not overlooked.
- The power of suggestion is strong, especially when the suggestion comes from a computer. Some pilots took the computer's bad advice even after they did their own manual analyses. The solution: Get users engaged in thinking about a range of options and, as a backstop, alert them to clearly bad decisions.
- Because of the large number of possible flight paths, pilots sometimes had difficulty finding a good option. The solution: Add optimization algorithms or expert systems to help identify good solutions.

The downside is that automated intelligence features are brittle, meaning they work only in situations that their designers anticipated. So, it's important to "keep the person in the loop" to consider factors not anticipated by the software.

In other words, the system has to be designed from the outset with the assumption that "both designers and users are fallible," say researchers Charles Layton, Philip J. Smith and C. Elaine McCoy.

They argue that what's needed is a *cooperative* problem-solving system that requires collaboration between users and the computer system. The computer should provide a good set of alternatives for vigorous human analysis and raise a red flag to avert disasters.

The ultimate goal of software development is not just to create technology but to help users do good work. A system that meets all of the technical specifications but leads to human errors is still defective, says Dorothy R. Graham, an independent software consultant in the UK.

"There are ways to reduce the likelihood of human error by the way systems are designed," Graham says. "As software engineers, we are irresponsible if we fail to take such human design principles into consideration along with technical design considerations."

Betts is *Computerworld*'s national correspondent in Washington. His MCI Mail address is 601-2483

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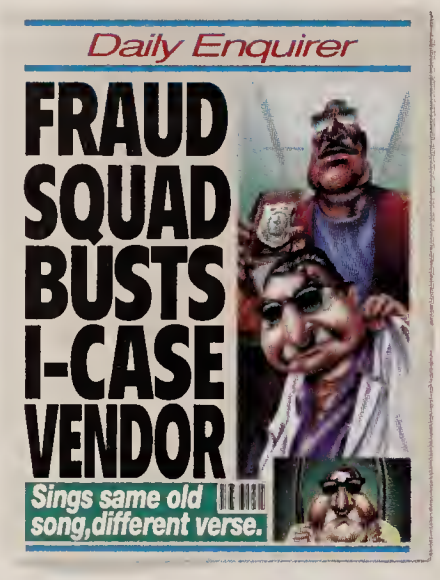

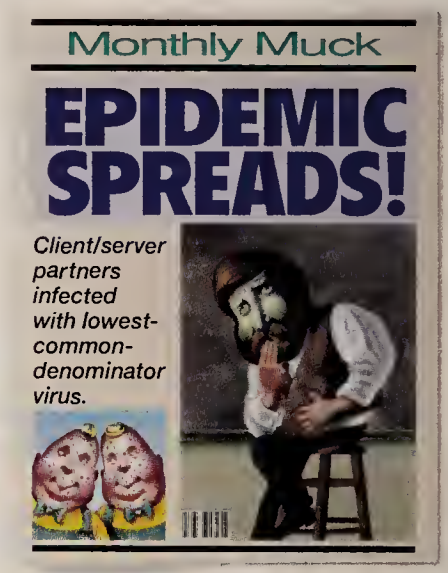

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New Products

Symantec Corp. has announced Enterprise Developer, a client/server application development tool for creating complex distributed database applications.

According to the Cupertino, Calif., company, Enterprise Developer embeds XDB Systems, Inc.'s SQL database engine, a database running under Windows that provides 100% of IBM's DB2 SQL on the PC.

Enterprise Builder uses a centralized business model to reduce time spent on all stages in the development cycle.

The embedded SQL engine includes an interactive SQL facility that allows users to interactively write SQL commands and edit data.

Enterprise Developer costs $1,795 per developer.

▶ *Symantec*
(408) 253-9600

Rational Software Corp. has announced Rational Apex, an Ada software engineering environment for Sun Microsystems, Inc.'s workstations running the Solaris operating system.

According to the Santa Clara, Calif., company, Rational Apex provides capabilities for team support, software testing, large-scale software reuse and post-deployment maintenance.

Features include program representation, optimal compilation, a full edit/debug capability, configuration management and version control.

Rational Apex costs $19,800.

▶ *Rational Software*
(408) 496-3600

BBN Systems and Technologies has announced TotalView, a source-level debugger for Digital Equipment Corp.'s Alpha AXP RISC workstation running the OSF/1 operating system.

According to the Cambridge, Mass., company, TotalView lets users perform source-level debugging for C, C++, Fortran and assembly languages on all aspects of their applications simultaneously. TotalView features a point and click interface, on-line help and easy menus.

Prices start at $525.

▶ *BBN Systems and Technologies*
(617) 873-3000

Ptech, Inc. has announced Ptech for Windows, re-engineering software that provides active process models and generates complete ANSI-standard C++ applications.

According to the Westboro, Mass., company, the active models apply the rules directing a business process so users can see how total behavior of a process is affected when parts are changed.

Business processes modeled and generated by the product can be compiled on any machine with a standard C++ compiler.

Ptech for Windows costs $1,995.

▶ *Ptech*
(508) 366-9166

Procase Corp. has introduced Smartstructure Chart and Smartreport Writer, products that provide key documentation capabilities and code comprehension.

According to the San Jose, Calif., company, Smartstructure Chart displays information on parameter types and control flow and distinguishes between modified or referenced data.

Smartreport Writer automates report generation on metrics, data dictionary, program build information, macros and errors.

Both products let users produce as-built documentation automatically to match the current state of the software.

Smartstructure Chart costs $3,000, and Smartreport Writer costs $1,000.

▶ *Procase*
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REALITY

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UNDER THE GUN

110,000 employees are attacked on the job each year, and more than 1,000 are murdered. No one knows how many customers are caught in the cross fire. Some companies are now turning to computers to stop the slaughter.

BY MELANIE MENAGH

THUGS SLAY TOURISTS IN THEIR RENTAL CAR

EX-EMPLOYEE KILLS FORMER SUPERVISOR

TERRORISTS BOMB DOWNTOWN OFFICE BUILDING

Fedex pilot David Sanders arrives at Memphis trauma unit after battling a hammer-wielding colleague in the air

Such is the stuff of daily headlines. Places where we once felt secure — crowded malls, quiet hotel rooms, our desk at work — have become scenes of murder and mayhem.

More and more, information systems are being tapped to find solutions. 7-Eleven stores have alarm systems hooked into off-site computers. Avis, Inc. is testing mobile phones to automatically link drivers to police. AT&T Corp. is deploying a new generation of tamper-proof identification cards containing embedded chips.

Obviously, computers can help avert violence against employees and customers. But while experts say large companies, in particular, are attempting to stem the violence and some corporations are using leading-edge technology, more companies need to become more aggressive about using computers in their security strategies.

"We need to see companies taking a proactive approach," says Eugene A. Rugala, a Federal Bureau of Investigation special agent and coordinator at the National Center for Analysis of Violent Crime in Washington. "Generally, people only get serious about developing a security program after they've had a problem. What they're doing is reacting to incidents — responding after the fact."

Workplace security concerns are rarely discussed in IS publications or at conferences. But the problem of workplace violence is so complex that IS staffers must be at the table.

Violent crime in the workplace falls into three distinct categories:

- Armed robbery: most common, with unknown assailants seeking money and/or goods.
- Employee-on-employee assault: troubled staff member, probably recently fired, returns to the office to seek revenge.
- Terrorism: attackers — usually unknown to the victims — motivated by religious and/or political fanaticism.

Each kind of crime requires an individual strategy designed to deter a different kind of assailant. All three types of assault are occurring in ever-increasing numbers.

The Centers for Disease Control and Prevention in Atlanta says on-the-job killings have reached epidemic levels. By 1992, the Bureau of Labor Statistics declared that homicide had become the second leading cause of death in

Under the gun, *page 106*

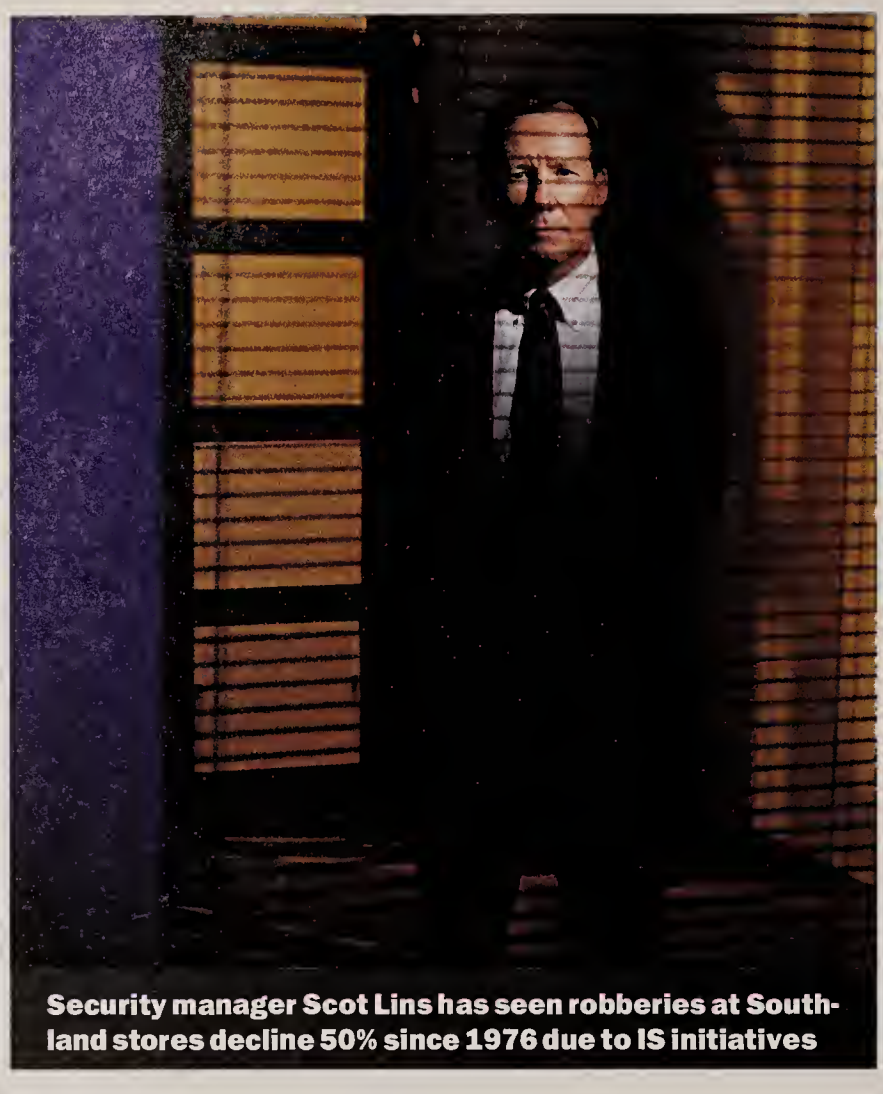
Under the gun

CONTINUED FROM PAGE 105

the workplace and No. 1 among female workers. Last year, there were more than 1,000 homicides committed at places of business.

That's only the tip of the iceberg. There are 110,000 violent incidents annually in the workplace, including shootings, stabbings and rapes. And these figures don't take into account customers caught in the cross fire.

How can information technology be used to keep our employees and our customers from becoming crime statistics?



REID HORN

Security manager Scot Lins has seen robberies at Southland stores decline 50% since 1976 due to IS initiatives

High-risk scenario

Robbery is the most common form of workplace violence, accounting for about 80% of all workplace deaths. Almost half of these deaths occur in the retail trade, especially at food and liquor stores and gas stations. The victim is typically working alone and handling money, and the crimes are usually committed between 7 p.m. and 2 a.m.

All of which is a thumbnail sketch of the basic business of Southland Corp. in Dallas, parent company to 7-Eleven convenience stores.

Southland has been using information systems for at least 10 years in a successful effort to reduce violent incidents in its 5,300 stores, according to Scot Lins, manager of corporate security and loss prevention at Southland. According to Lins, robberies at Southland stores have declined by 50% nationwide since 1976. Its latest initiative, begun in November 1993, is a computer-integrated, closed-circuit camera and alarm system.

The system features a wireless safety device worn by store clerks. During an incident, the clerk depresses an alarm that activates an automatic dialer to the supplier of the system, the Silent Watchman Division of National Guardian Security Services Corp. in Columbus, Ohio. National Guardian in turn contacts the local police department.

Incidents of in-store crime and violence are tracked by one of Southland's eight regional "loss prevention managers." Each manager collects information on 300 to 900 stores.

Computers record incidents by type of crime, description of perpetrator, time and date and weather conditions. Loss prevention managers use this data to generate crime trend reports and to recommend initiatives and intervention.

They also notify individual stores when there are problems in their area.

"We call it 'rat packing,'" Lins says. "Transient people who travel in packs come in and blitz a store and will hit stores all over the city. If this happens, the loss prevention manager can call 400 stores via computer. . . . It's sort of like electronic smoke signals."

These smoke signals — actually, recorded voice messages — may be sent every shift or just once a week, as managers deem necessary.

Loss prevention managers also use a message distribution program — Watson from Natural MicroSystems in Natick, Mass. — that automatically calls stores with a checklist of security reminders: "Have you dropped your large bills [in the safe]?" "Are your front windows free of signs?"

These security measures seem to be helping, Lins notes. "Among the industries tracked in the FBI's crime reports, ours is the only one where robberies have gone down."

Travelers beware

The car rental industry has been another flashpoint for violent crime.

"When we do focus groups asking customers what's their primary concern," says Russell James, vice president of corporate communications at Avis, "93% say safety."

A series of attacks on Florida tourists first drew national attention to the problem in October 1992. Since then, there have been 10 fatalities in attacks related to rental cars in southern Florida alone. "People would be followed out of the baggage claims area. They'd roll out of the parking lot, turn on the dome light and look at a map — easy targets."

Since this rash of incidents, Avis has begun experimenting with different safety systems in some of its cars in Orlando, Fla., San Jose, Calif., and New York.

Perhaps the Garden City, N.Y., company's most advanced project is the Northstar system (developed by Nynex Corp. in Elmsford, N.Y., Stanford Telecommunications, Inc. in Sunnyvale, Calif., and

Under the gun, *page 111*

QUOTABLES

When we do focus groups asking customers what's their primary concern, 93% say safety.

— Russell James, vice president of corporate communications, Avis, Inc., Garden City, N.Y.

We need to see companies taking a proactive approach. Generally, people only get serious about developing a security program after they've had a problem. What they're doing is reacting to incidents — responding after the fact.

— Eugene A. Rugala, FBI speciat agent and coordinator, National Center for Analysis of Violent Crime, Washington

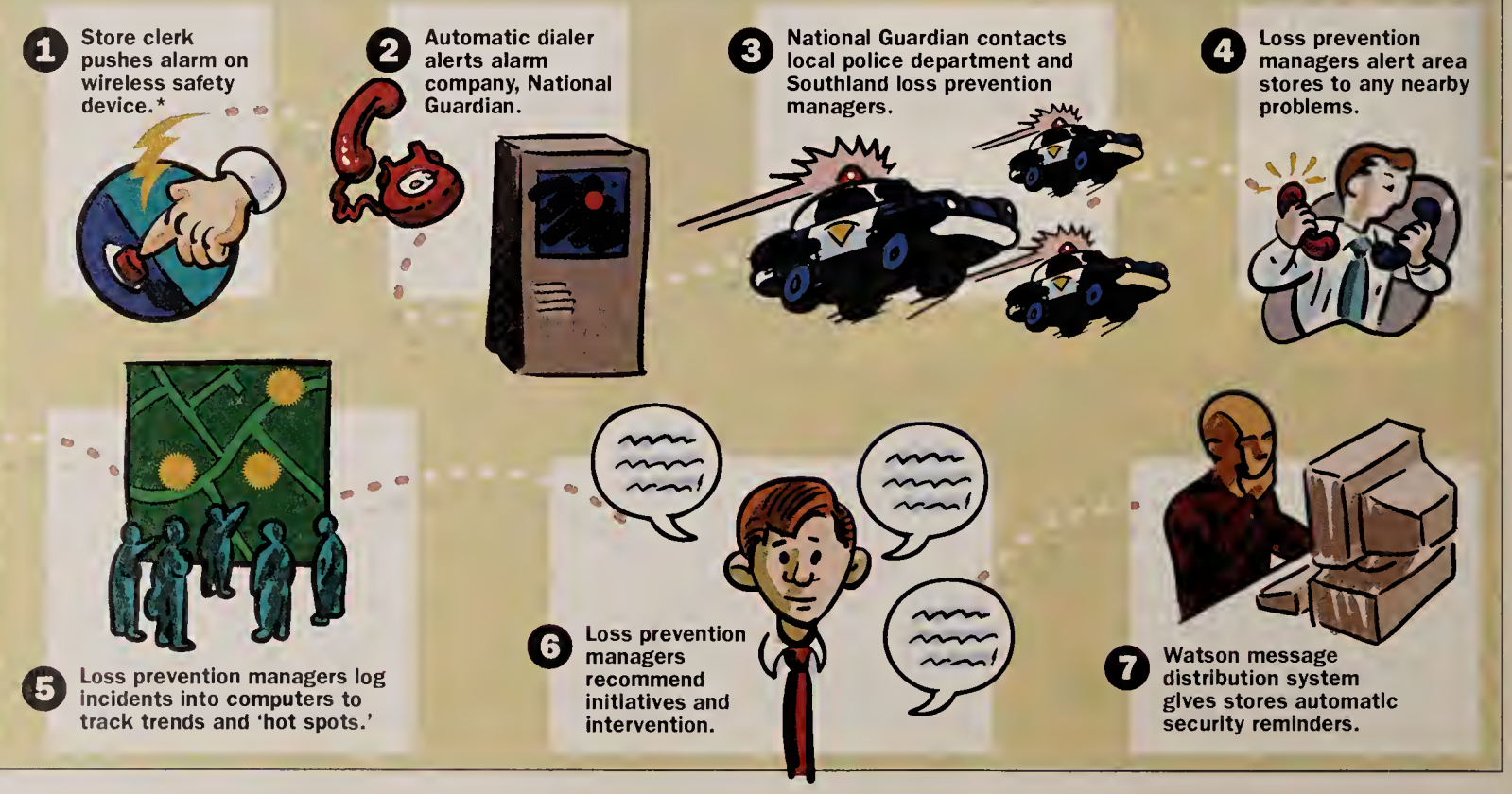
Companies have to step in and take action. If you can intercede at the front end, you're always better off. Prevention is cheaper in the long run.

— Eugene A. Rugala

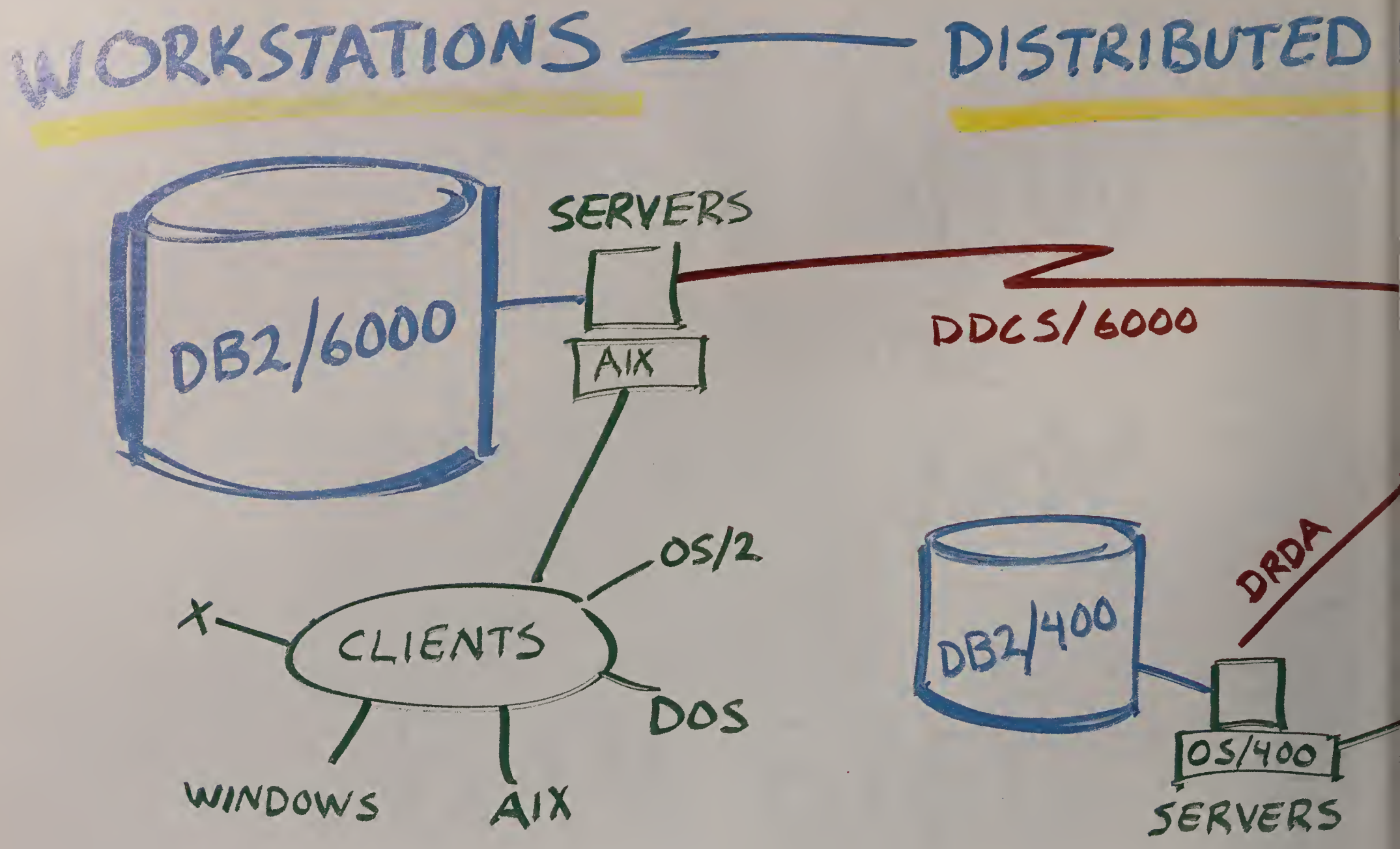
SOUTHLAND CORP.

Southland in Dallas, parent company of 7-Eleven convenience stores, uses a computer-integrated alarm system to help protect its store employees.

*For employee safety reasons, Southland declined to describe more precisely the wireless devices worn by its store clerks.



Where can you safely put your data in a distributed environment?



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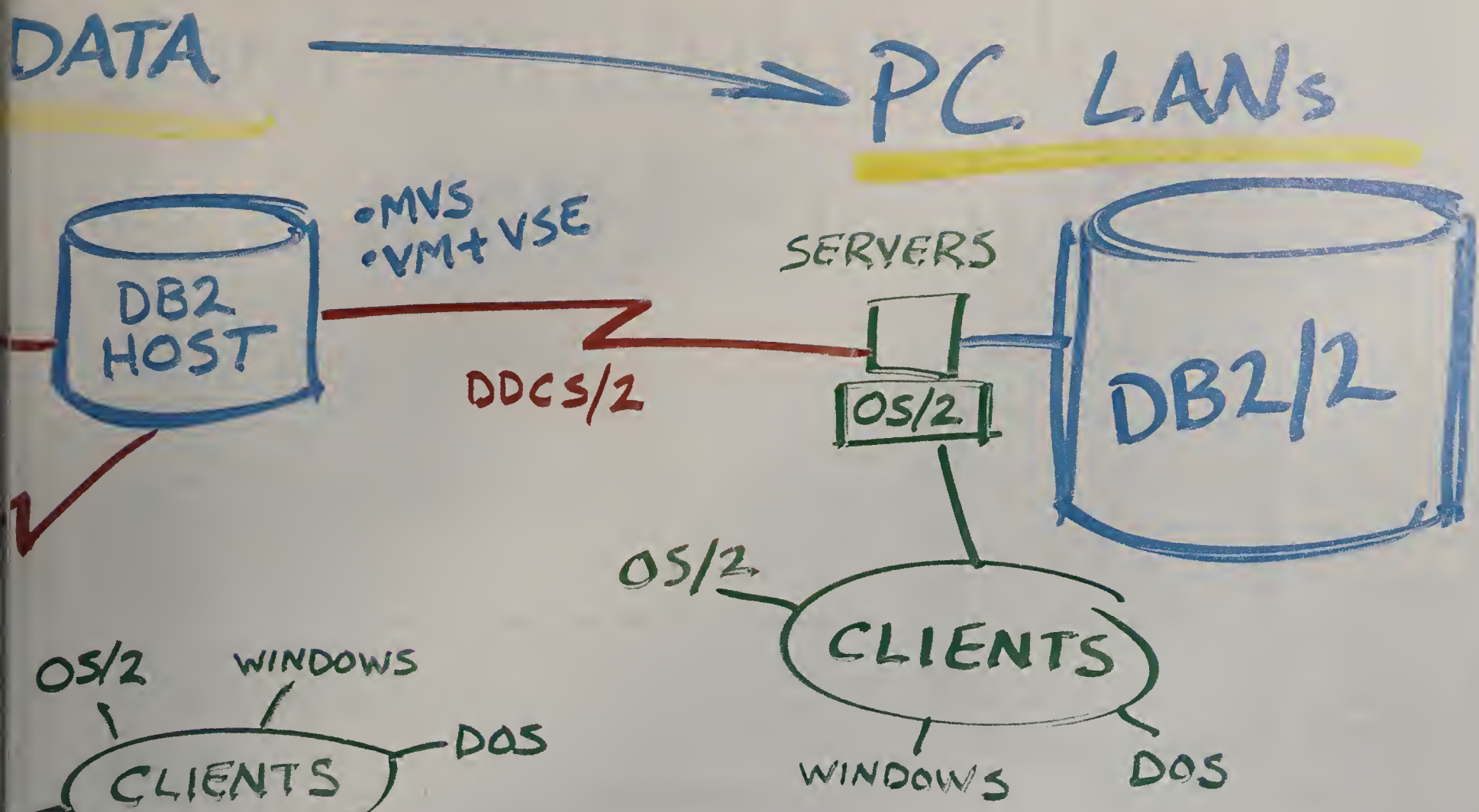

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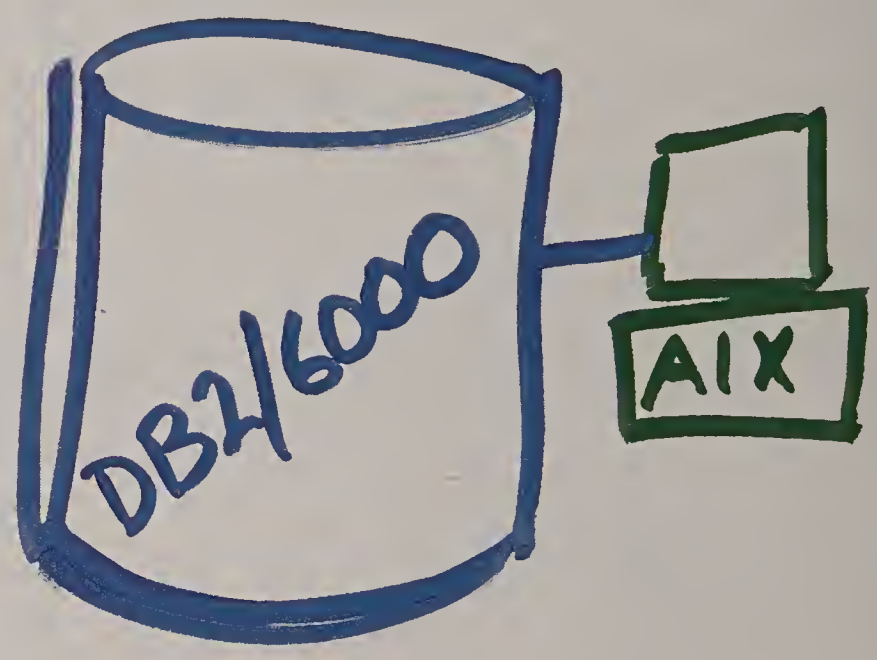

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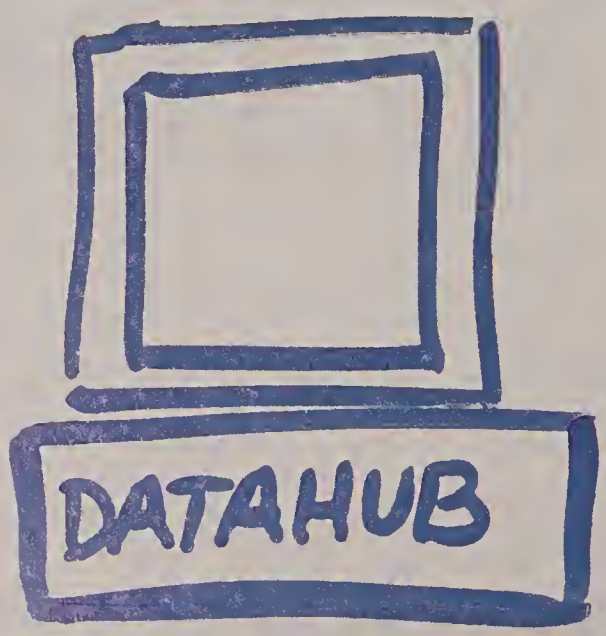

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Under the gun

CONTINUED FROM PAGE 106

GeoSystems in Atlanta), which is being tested in rental cars based at metropolitan New York-area airports.

Northstar uses a boat navigation-type system to determine a car's location. The Northstar system features a transmitter about the size of a silver dollar in the car's back window. A tracking satellite relays the car's position to a central command center run by Nynex.

The car's position is projected as an icon traveling along a grid map, with constant monitoring of its course. Its cellular phone is preprogrammed to provide the driver with one-button dialing to the command center to get traffic and travel information, emergency roadside service and police assistance.

"It's like having an invisible passenger helping you read the map," James says. "If you need emergency road service, they can pinpoint where you are, and a button connects you immediately with the state police."

Other systems being experimented with actually use a CRT screen on the dashboard of the car to give the driver visual access to his location on a grid map, travel tips and directions.

AT&T has also designed its own internal IS application to protect its employees when they're on the road. Corporate security maintains a folder on AT&T's internal electronic-mail system dealing with international activities and travel.

"If one of our people is going to, say, St. Petersburg, Russia, they can access an AT&T mail folder with information on what areas to stay away from, hotels to avoid, if and when to take the subway — all based on the latest information from the State Department," says Steve Kostiw, an AT&T district security manager.

OUT OF CONTROL

On the job killings have reached epidemic levels:

- **Second leading cause of death in the workplace.**
- **No. 1 cause of death among female workers.**
- **More than 1,000 murders committed at places of business in 1993.**
- **Robbery accounts for 80% of all workplace deaths.**
- **Half of these murders occur at food stores, liquor stores, gas stations and other small retailers.**

Source: Centers for Disease Control and Prevention, Atlanta

Peer pressure

Preventing employee-on-employee violence requires still different strategies. Although homicides account for only 9% of total workplace deaths, some companies and industries such as the U.S. Postal Service have been hit especially hard.

Because perpetrators are usually known to the victims, intervening early to identify and help potential assailants before they strike is one way to curb this form of violence. The other is to keep potential assailants (as well as other criminals) off the premises.

In the past two years, the post office (which has lost 35 staffers to employee-related violence since 1986) has initiated employee counseling programs and a hot line to help troubled workers, says Frank Marion, manager of the Security Group for Inspection Services at the U.S. Postal Service. A second 800 number enables employees to report suspicious behavior or threats by another worker.

"In the past, we said problems at home were their business," Marion says. "Now we realize it's up to us to intervene and help them out with counseling if we can."

But while access to police records and files could help employers identify potential perpetrators, legal constraints curtail their use.

"There are privacy concerns," says Frank Scafidi, special agent at the FBI's Washington field office. "It's a problem that the law prevents us from giving out information to the private sector. Our hands are tied."

Help yourself

So some companies are taking matters into their own hands. At least one organization is using computers to determine whether threats to employees are real.

The Academy Group in Manassas, Va., a for-profit consultancy of retired FBI agents who study violence and criminal behavior in the workplace, uses computers in its threat assessment program.

"We take written or oral communications from the potential perpetrator and use computer programs to look at the sophistication of their writing or language," says

Under the gun, *page 112*

SECURING THE SKIES

Airplanes and airports have long been targets of violence by terrorists. In recent years, notably since the destruction of a Pan Am flight over Lockerbie, Scotland, the Federal Aviation Administration has introduced new airport security systems, says Lyle Malotky, scientific adviser at Civil Aviation Security.

International luggage is now tagged using bar-code technology to ensure that a bag doesn't fly without a passenger.

An electronic bulletin board for FAA managers nationwide posts security advisories and other security-related information.

The newest generation of luggage scanners use computers, including neural networks — a new kind of computer that can recognize patterns in ways that mimic human intelligence — and chemical trace detectors, to spot weapons and explosives.

These luggage scanners can even help keep security agents on their toes. "Agents can be lulled into complacency by the routine of watching bags go through a screen," Malotky says. "We can get the computer to . . . impose the image of a weapon on your bag. This random test helps increase the level of vigilance."

The ultimate goal of the FAA's IS security systems, Malotky says, is to "let computers solve 90% to 95% of our routine problems and identify the other 5% of the difficult and anomalous problems that call for human intervention." — *Melanie Menagh*

WIDE WORLD PHOTOS

Latest luggage scanners can spot weapons and explosives, as well as trace chemicals

AVIS, INC.'S NORTHSTAR

Avis is testing Nynex's Northstar system to protect rental car passengers at metropolitan New York-area airports.

Under the gun

CONTINUED FROM PAGE 111

Richard L. Ault Jr., vice president for operations.

The Academy Group uses Grammatik, a software package from WordPerfect Corp., to assess whether the threats are serious.

"We look for inconsistencies," Ault says. "For instance, if the writer uses big, sophisticated words but their grammar is at a first-grade level, we note that. We check to see what lengths the person has gone to disguise their true voice."

The more inconsistencies and contradictions in logic, grammar or word usage there are, the more likely it is that the threat is extremely serious.

EASY PREY

There have been 10 fatalities since a series of attacks on Florida tourists in rental cars first drew national attention in October 1992. "People would be followed out of the baggage claims area. They'd roll out of the parking lot, turn on the dome light and look at a map — easy targets," says Russell James, vice president of corporate communications at Avis, Inc. in Garden City, N.Y.

Source: Centers for Disease Control and Prevention, Atlanta

Security departments at large company headquarters are developing new techniques to keep trespassers off their property. AT&T has just introduced a new generation of smart cards to double as security clearance and ID cards.

What sets these cards apart, says Eric Leitz, security manager at AT&T Global Real Estate, is that "it's difficult — if not impossible — to hack into them. There are built-in security algorithms on the card, and readers are sophisticated — a proprietary piece of hardware. With other [kinds of cards], it's easy to go to [a local electronic store] and get a reader/writer to tamper with a card.

"You can't look at or touch the chip," he continues. "It looks like a standard credit card. All the electronics are buried beneath the opaque plastic so a hacker can't find the chip and change it."

Minneapolis-based Honeywell, Inc., one of the leading manufacturers of security equipment, is working on systems for the future. Its top-of-the-line systems rely on biometric IDs using voice recognition, retinal scans, fingerprints or palm configuration to determine whether a person has clearance to enter.

The drawback is that these systems can cost five to 10 times more than conventional ID technology, says Stephen Nelson, Honeywell's manager of worldwide security business.

What price, life?

State-of-the-art IS security systems can be complex and expensive, but industry is finding that not developing an adequate security system can exact a higher price. Violent incidents cost employers an estimated $4.2 billion.

On top of injured employees and customers and the accompanying bad publicity, companies are facing litigation by the victims. The Occupational Safety and Hazard Administration Act mandates that employers must provide a safe place to work. People who have been targets of violent crime in the workplace are now suing companies for failure to provide adequate safety measures.

"Companies have to step in and take action," the FBI's Rugala says. Like most problems, "if you can intercede at the front end, you're always better off. Prevention is cheaper in the long run." ■

Menagh is a free-lance writer based in New York.

Calendar

JULY 3-9

Enhancements to Mature Chargeback & IS Financial Reporting Systems. Scottsdale, Ariz., July 6-8 — The seminar will focus on information systems chargeback and financial effectiveness and efficiency. Contact: Financial Management for Data Processing, San Francisco, Calif. (415) 731-3706.

Technomics '94. Orlando, Fla., July 6-8 — Topics include sources of lease financing; impact of specialization, diversification and captives; strategies and tactics as the industry matures; and impact of leasing on corporate financial ratios. Contact: International Computer Negotiations, Inc., Winter Park, Fla. (407) 740-0700.

JULY 10-16

Infostructures for Health Care Reform. Portland, Maine, July 10-12 — Theme: "The Information Systems You'll Need Through the Year 2000." Contact: Inside Healthcare Computing, Oxnard, Calif. (805) 984-8500.

1994 APPC/APPN Technical Conference. Boston, July 12-15 — Keynote speaker: Ellen Hancock, IBM's senior vice president of networking solutions. Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

Third Annual Summer Meeting, Forming Partnerships with Industry. Washington, July 13-14 — Contact: Tracee Joltes, The National Technology Transfer Center, Wheeling, W. Va. (304) 243-2535.

Fourth Annual National Technical Information Service (NTIS)/Japan Information Center of Science and Technology Conference. Boston, July 14-15 — Theme: Japanese scientific and technical information. Contact: NTIS, Springfield, Va. (703) 487-4819.

Understanding Document Imaging: Managing Corporate Information in the 90s. Chicago, July 11-15. Also being held in Boston on July 18-19; Washington on July 21-22; New York on Aug. 15-16; Dallas on Aug. 22-23; and San Francisco on Aug 29-30. The course will examine the underlying technologies, buzzwords and components of document imaging to lower costs, improve customer service, reduce data errors, eliminate lost files, reduce space requirements and minimize paper flow. Course fee: $895.00 — Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400.

JULY 17-23

Internal Consulting in Large Organizations: The Skill of Technical Liaison. Washington, July 18-20 — Contact: Continuing Engineering Education Program, George Washington University, Washington, D.C. (202) 994-6106.

Communications Opportunities in Health Care. Washington, July 19-20 — Topics: Generating new business through health care reform, networking requirements of managed care, telemedicine, home-centered care and other health care delivery trends, automated claims processing, computerized patient records and teleradiology. Contact: TeleStrategies, Inc., McLean, Va. (703) 734-7050.

Conference for Artificial Intelligence Applications on Wall Street and Worldwide. New York, July 20-21 — Focus: "Developing and Profiting from Advanced Technologies Trading and Asset Management." Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

Configuration, Performance and Storage Management for Enterprise Client/server Systems. Washington, July 20-21 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

JULY 24-30

Systems Software Conference '94. Orlando, Fla., July 24-29 — Contact: Computer Associates International, Inc., Islandia, N.Y. (800) 925-2663.

Object World. San Francisco, July 25-29 — Contact: Rachel Winett, IDG World Expo, Framingham, Mass. (508) 820-8608.

Sixth Annual Computer Security Incident Handling Workshop. Boston, July 26-27 — The workshop targets computer security professionals who must deal with increasingly sophisticated security incidents and system vulnerabilities. Contact: Lawrence Livermore National Laboratory, Livermore, Calif. (510) 423-2455.

New Directions in Cellular '94. Washington, July 26-27 — The conference will focus on the competitive outlook for cellular-based personal communications services (PCS); implementation challenges for time-division multiple access, code-division multiple access and global systems for mobile communications; wideband digital radio technology and economics; PCS spectrum allocation and the auction process; and Cellular Digital Packet Data user demand analysis, new antenna technology and fraud control. Contact: TeleStrategies, Inc., McLean, Va. (703) 734-7050.

Essential Skills and Knowledge for Effective Incoming Call Center Management. Seattle, July 26-28 — Contact: ICMI, Inc., Annapolis, Md. (410) 267-0700.

Windows World '94. Chicago, July 26-28 — Focus: Implications and impact of enterprise computing and the benefits of implementing a business-oriented information technology strategy. Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Managing Enterprise Networks '94 — A Survivor Guide to Network and Systems Management. Boston, July 27-29 — Keynote speaker: David Passmore, president of Decisis, Inc. Topics: "Strategic Decisions: Choosing a Management Platform," "People and Money: Management Issues in Network Computing." Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

JULY 31 - AUG. 6

Tools USA '94. Santa Barbara, Calif., Aug. 1-5 — Contact: Tools USA '94, Santa Barbara, Calif. (805) 685-1006.

International Storage Systems Symposium. San Francisco, Aug. 2-5 — The conference is devoted exclusively to storage. Contact: Skill Dynamics, Dallas, Texas (214) 406-7200.

IS Self-Assessment and One-on-One Benchmarking Seminar and IS Financial Benchmarking and Peer Analysis Conference. Washington, Aug. 2 (seminar) and Aug. 3-5 (conference) — Seminar is intended for those contemplating information systems benchmarking or interested in starting the benchmarking process with little out-of-pocket expense. Conference presents the variety of principles and practices used to conduct internal and external IS financial benchmarking and peer analysis. Contact: Terence Quinlan, Financial Management for Data Processing, San Francisco, Calif. (415) 731-3706.

Macworld Expo. Boston, Aug. 2-5 — Contact: Macworld Expo International hot line, Hyde Park, Mass. (617) 361-3941.

AUG. 7-13

Share Summer 1994 Meeting. Boston, Aug. 7-12 — Keynote speaker: Louis V. Gerstner, IBM chairman and chief executive officer. Contact: Share, Chicago, Ill. (312) 822-0932.

The Asynchronous Transfer Mode (ATM): Foundation for Broadband Networks. Denver, Aug. 8-9. Also being held in Troy, Mich., on Oct. 10-11; Philadelphia on Oct. 24-25; and Atlanta on Oct. 26-27 — Contact: Lori Ann Milhaven, International Institute for Learning, Inc., New York, N.Y. (212) 758-0177.

Re-engineering with Knowledge: Getting the Most Value from Your Most Valuable Asset. Chicago, Aug. 13 — Seminar will highlight the effective dissemination, consolidation and automation of knowledge. Contact: Carnegie Group, Pittsburgh, Pa. (800) 284-3424.

AUG. 14-20

The On-line Networking Exposition and Bulletin Board Service Convention. Atlanta, Aug. 17-21 — Contact: One, Inc., Aurora, Colo. (303) 693-5253.

SEPT. 11-17

Distribution/Computer Expo '94 East. Atlantic City, Sept. 13-14 — Contact: "C. S. Report," Uwchland, Pa. (610) 458-6410.

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the new BALANCING act

VENDORS MUST DELIVER MAXIMUM POWER AT A MINIMUM PRICE

BY CHARLIE BURNS

To companies with large data centers, the future of the traditional mainframe is of utmost importance. As the next century approaches, users wonder if mainframe cost, performance and functionality can compete with more scalable, open alternatives or if big iron will be relegated to running only a dwindling roster of legacy applications.

Recently, traditional mainframe vendors have publicized the results of strategic internal plans and some very secretive negotiations to address these issues.

On April 6, IBM announced mainframe hardware and software products intended to answer the challenge posed by the legion of aggressively encroaching alternative platforms that have been stealing market share from IBM's coveted System/390 traditional mainframes. The new products include the following:

- Parallel query and transaction servers.
- A version of MVS, System/390's mainstay operating system, with more open standards and interfaces.
- A member of the top-of-the-line ES/9000 family featuring a 10-way set of processors.
- RISC-based massively parallel processing systems.
- Air-cooled models.
- Software pricing alternatives.

Most of the new products are designed to make the venerable System/390 platform more cost competitive. The new servers mark the beginning of IBM's transition from the traditional emitter-coupled logic (ECL)-based mainframe technology to lower-cost systems using CMOS technology.

Two new IBM components, Coupling Facility and Workload Manager, provide the capability to manage many traditional mainframes and the newly introduced servers in a single, logical computing environment called Parallel Sysplex.

Meanwhile, Amdahl Corp., in a series of announcements from March 29 to May 23, detailed its new product offerings, including the following:

- A parallel database server based on NCube processors.
- 10-way and 12-way models of its high-end 5995 family.
- Improved availability of support for several IBM compatibility features.
- Commitments to support IBM's new Parallel Sysplex functions.

In addition, Hitachi Data Systems Corp. has done the following:

- Enhanced the function of its Osiris LAN backup and support offering.
- Stated its intention to provide both parallel CMOS mainframes and another traditional

Balancing act, *page 118*

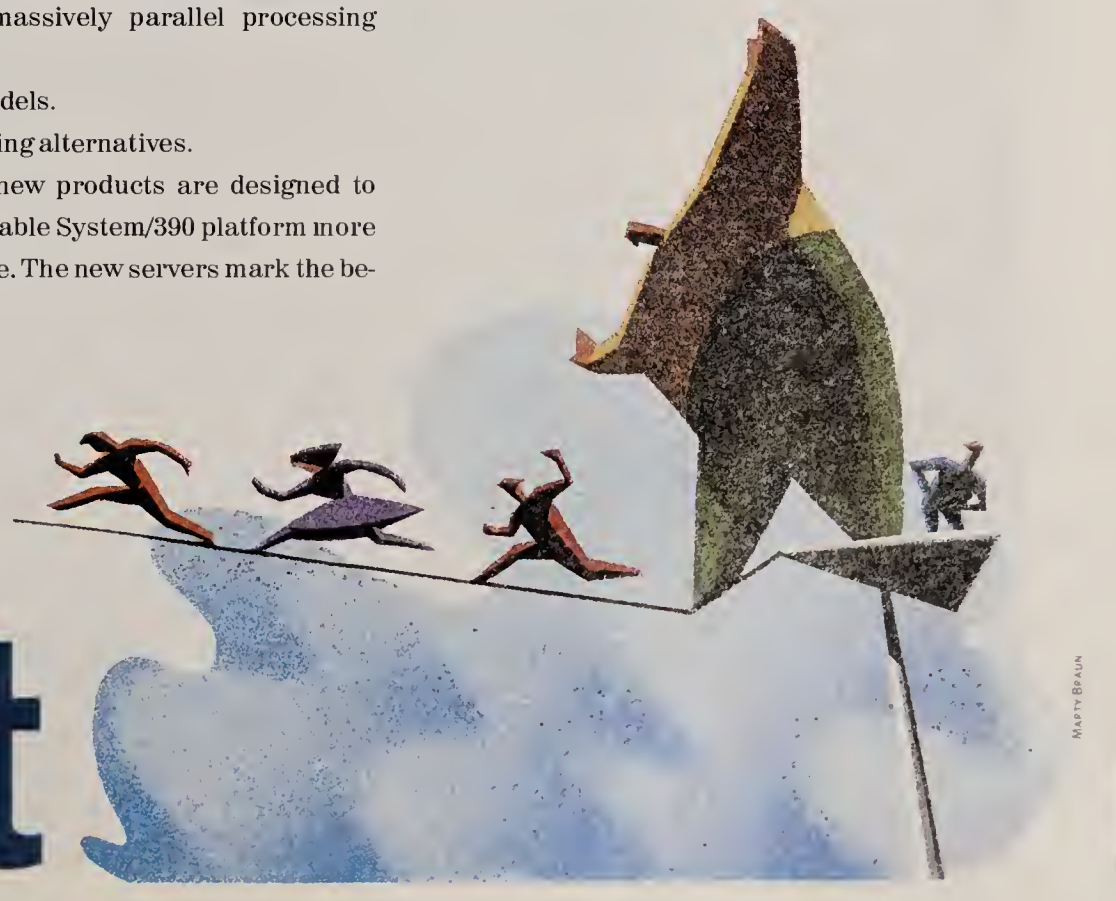
HEAD TO HEAD

Mainframe alternatives from Hewlett-Packard and Sun still come up a little short in user satisfaction

See Buyers' Scorecard page 120

	ES/9000	Mainframe alternatives
Reliability	8.5	7.9
Storage	7.9	7.5
Technical support	8.1	7.3
Operating system	7.7	7.5
Throughput	7.7	7.4
Cost	6.2	6.8
Performance	7.3	7.1

Ratings based on 1-to-10 scale, where 10 is best



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the new BALANCING act

CONTINUED FROM PAGE 115

ECL mainframe.

• Stated its intention to support IBM's Parallel Sysplex functions.

Hitachi and Unisys Corp. have also separately announced technology agreements with IBM. In both cases, IBM will provide CMOS microprocessor chips for use in the other vendors' future systems. Additionally, IBM is supplying PowerPC chips and the Power Parallel (SP2) system to Hitachi.

Unisys has been using CMOS technology for its 2200 family and enterprise server offerings for several years and, on April 11, announced new A18 models incorporating gallium arsenide technology.

Unisys Extended Processing Complex (XPC) enables the linking of multiple systems into a single complex, and Unisys DataCentral offers simultaneous decision support and high-volume transaction processing in the one system.

The new hardware and software offerings clearly strengthen the appeal of the mainframe, especially for high-end users. Even more important, however, is the fact that as a whole, they provide a logical vision of the transition from the traditional mainframe to the low-cost, scalable mainframes of tomorrow.

No longer the only game in town

For most of the 30 years since IBM's System 360 was introduced, the mainframe has not simply been the right choice for many organizations; it has been the only choice for new applications and work loads. Consequently, it is estimated that customers worldwide have already invested more than a trillion dollars in just IBM architecture mainframe systems and applications.

Today, desktop systems, such as PCs or workstations, and alternative mainframes, including Unix multiprocessors, appear to have dramatically lower costs than traditional mainframes.

Mainframes have become politically incorrect, and many users are already scrambling to move away from them. A recent Gartner Group, Inc. survey of 400 information systems managers showed that 80% of those who had moved applications off their mainframes found off-loading more difficult than they had anticipated; 90% said it took longer; and 76% said it had cost more.

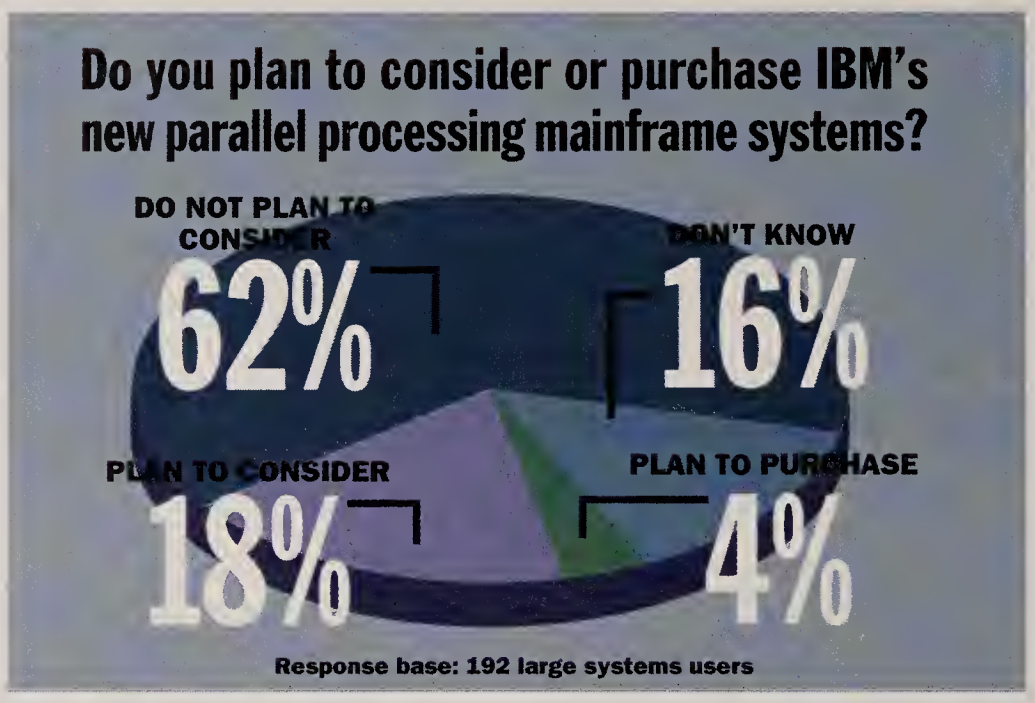
Although 69% said off-loading has been cost-effective overall, off-loading a single application is child's play compared with re-engineering the massive and interrelated web of mainframe-based software and data that most users now have.

Nevertheless, applications are fleeing the traditional mainframe species by species, in the following order:

1) New applications of all types.
2) Decision-support and fourth-generation applications.
3) Software development.
4) Some packaged applications and simple production jobs.
5) Large, complex custom-written production jobs.

Focus on reducing

Attempting to reverse the trend toward alternatives and to reinvigorate the use of mainframes for new applications, traditional mainframe vendors have focused their efforts on dramatically reducing hardware prices and expanding support of open nonproprietary interfaces such as Posix and protocols such as TCP/IP.



Examples of this new direction for mainframe vendors are IBM's Parallel Query Server (PQS), Amdahl's Xplorer 2000 and Unisys' DataCentral. However, none of these should be viewed as just another mainframe; they should be evaluated differently.

All three are being positioned to compete in the relational database query market. The dominant systems in that market are products developed by AT&T Global Information Solutions and Teradata Corp. All three are designed to handle elaborate, often complex and unstructured database searches, but the databases such as Oracle Corp.'s Oracle.

Mainframe software pricing

Reducing hardware costs alone will not reduce total system costs sufficiently. By 1996, software will be the largest component in the total cost of mainframe ownership. Mainframe software constitutes a significant revenue stream to IBM and other vendors, and cutting software prices to match hardware reductions is counter to IBM's effort to boost declining revenue.

However, to promote mainframe sales, products also demonstrate the different paths these vendors are pursuing.

PQS must attach to a mainframe; Xplorer and DataCentral can either attach to a mainframe or stand alone and connect directly to a network. IBM is positioning Parallel Transaction Server (PTS) and Unisys is positioning DataCentral as platforms for on-line transaction processing (OLTP).

Their goal is to be competitive with parallel architecture systems such as Digital Equipment Corp.'s VAX AXP, Hewlett-Packard Co.'s HP 9000, Sun Microsystems, Inc.'s SPARCcenter 2000, and Encore Computer Corp.'s Infinity 90, which typically use Unix and open

ALTERNATIVE SCENE

Traditional big iron vendors are looking to the future by planning a variety of alternative systems and technologies

COMPANY	ALTERNATIVE
IBM	• Parallel Sysplex (for linking multiple systems) • Parallel Transaction Server • Parallel Query Server
Amdahl	• Xplorer 2000 (query server)
Digital	• VAX AXP (based on Alpha AXP chip)
Unisys	• DataCentral (OLTP and decision-support system) • Extended Processing Complex (for linking multiple systems)

IBM did announce several software pricing changes, such as the consolidation of elimination of software groups, including the elimination of software pricing groups 90 and 100; measured-usage pricing for some components; and the Parallel Sysplex software pricing structure, which can provide a price reduction vs. traditional, tiered System/390 pricing.

The pricing announcements for new mainframe and database server hardware and related software represent important steps. IBM, Amdahl and Unisys have moved to lower-cost mainframe offerings to enable more effective competition with the aggressively priced alternative platforms, which are rapidly gaining functionality.

Requirements restrict benefits

However, because of some software and hardware requirements needed to implement these new offerings and derive benefit from them, the users who stand to benefit with the least investment are already using the most recent mainframe products.

For example, users with multiple Model 711 System/390s are likely to have good cause for implementing a PTS and/or Parallel Sysplex. It is difficult to justify the expense of ES/9000 upgrades to obtain the potential benefits and software savings of Parallel Sysplex.

Will the mainframe vendor marketing juggernauts persuade user departments to embrace these offerings? Will mainframe demand continue to decline? While the jury is out, there are seven caveats for users considering the new offerings:

First, when evaluating platforms for new database query or OLTP applications, identify the requirements of the application — for example, level of security, transaction integrity and backup/recovery.

Second, consider the strengths of all alternatives, including IBM's parallel servers, Xplorer and DataCentral.

Third, negotiate terms and conditions that address the acquisition, upgrades and/or disposal of these transitional first-generation systems.

Fourth, seek special consideration and clauses for the PQS, PTS and a Parallel Sysplex environment when negotiating with independent software vendors.

Fifth, implement an "open enterprise" information technology architecture to maximize technology flexibility and minimize costs.

Sixth, apply a just-in-time acquisition strategy to take advantage of rapid price reduction.

Seventh, position lease expirations and depreciation schedules of traditional hardware to make the transition to new technology in 1996 and/or 1997.

The choice is between retaining and enhancing a traditional mainframe and purchasing another large and equally costly alternative system.

The transition has only just begun. ■

Burns is program director of large computer strategies at Gartner Group, Inc. in Stamford, Conn.

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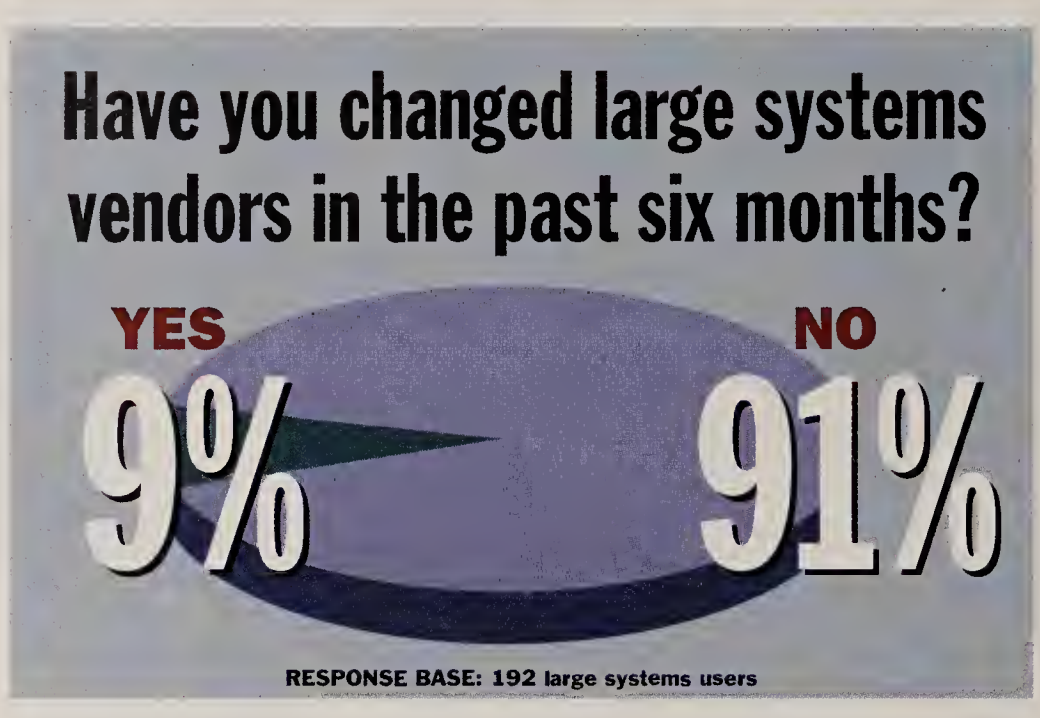
Users slow to switch

Unix vendors chip away at mission-critical mainframe features

By Nancy Stewart

Vendors of traditional mainframe systems have taken a severe beating in the market during the past few years. In fact, in 1993 mainframe vendors experienced the worst revenue slide of any segment of the market. It is likely that the market reached its bottom last year — at least that's what vendors such as IBM, Hitachi Data Systems Corp. and Amdahl Corp. are hoping.

On the other hand, the Unix-based midrange and workstation markets have shown continued growth during the past several years, and the high growth trend is expected to continue through the next five years.



Trying to keep up

For the future, alternative systems vendors sporting Unix platforms are scrambling to match the administration and reliability features of the mainframe. Traditional big iron makers are moving to cheaper CMOS processors to cut their pricing disadvantage.

It looks like the traditional mainframe is in serious trouble, but the dramatic shift to client/server may not be as swift as has been touted. If users are turning from host-centric computing, long dominated by the IBM mainframe/MVS model, what is driving this change?

Users in large and medium-size data centers surveyed by Dataquest, Inc. within the last year say they view PCs, workstations and midrange systems as more important than mainframes in their current and future information systems architectures. And these sites, which have long been the domain of mainframe technology, are far more likely to purchase platforms other than mainframes in the next two years.

In fact, users' server purchase plans are heavily geared toward PC servers, followed by midrange servers. A number of users plan to move or are already moving mission-critical applications to client/server platforms. In the next two years, the shift in IS architectures will be significant.

Cost is the most compelling reason for moving to Unix-based servers and the client/server style of computing. While much of the discussion early in the client/server era focused on cost, only now is the full extent of the requirements and the resulting costs and savings of the new model truly being understood.

Users do focus heavily on the cost issues — the cost of the hardware, the software, the network and so on. However, users are going beyond the low-cost notion and citing in increasing numbers, ease of use and development flexibility as reasons to move to client/server computing.

What's important

Computerworld's Buyers' Satisfaction Scorecard survey of 184 large system users revealed that IS organizations hold reliability, storage, technical support and operating system features as more important than cost or perfomance issues. The Scorecard ratings (below) reveal that the mainframe alternatives still have some ground to cover in meeting users' needs in these areas.

For these reasons and others, users are cautious about migrating to nontraditional platforms. They are demanding that many of the features and functions of the mainframe environment be a part of their new architectures. At least half of the users in large and medium-size data centers are not moving mission-critical applications to client/server platforms in the next two years, according to information compiled by Dataquest.

Most of the midrange Unix-based systems vendors are making a serious run at large data center sites, not always

COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

Not dead yet

ES/9000 relies on old strengths to outpoint smaller alternatives

Because nearly every minicomputer and server is touted as a "mainframe killer," the Buyers' Satisfaction Scorecard gave a few Davids the opportunity to slug it out head-to-head with Goliath.

Goliath won.

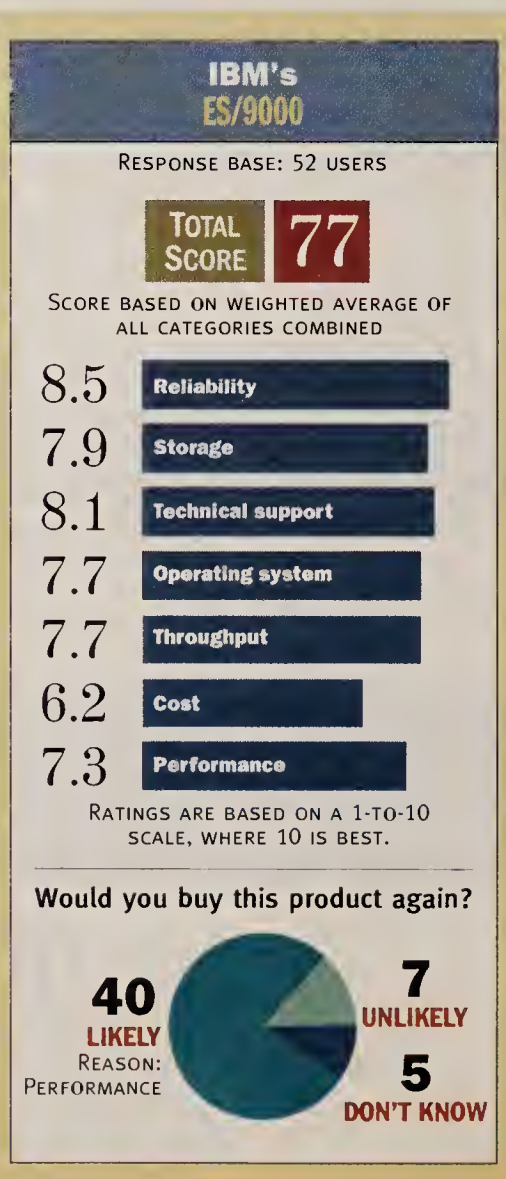
IBM's ES/9000 mainframe system outscored both Hewlett-Packard Co.'s HP 9000 Series 800 and Sun Microsystems, Inc.'s SPARCcenter 2000 in overall user satisfaction.

The mainframe's traditional strengths were borne out by the survey results. Though its smaller rivals equaled or outscored it in cost of acquisition and maintenance, the ES/9000 took higher satisfaction scores in reliability, security and technical support.

The scores in the area of performance were notable because downsizing systems are frequently marketed on the basis of greater bang for the buck. The alternative systems were unable to match the ES/9000 in on-line transaction processing and batch-processing performance satisfaction, but they did top it in performance in ad hoc and decision-support applications. However, large system users indicated they place much more importance on system availability, crash-recovery capability and storage capacity than on raw performance.

The HP 9000 Series 800 topped the mainframe by a wide margin in cost and also earned solid grades in functionality of operating system and ease

BY DEREK SLATER



touting their products as outright replacements for mainframes but as supplemental platforms for application development and as distributed client/server applications deployment platforms.

Platforms from vendors such as Data General Corp., Digital Equipment Corp., Hewlett-Packard Co., Pyramid Corp., Sun Microsystems, Inc. and Sequent Computer Systems, Inc., are proliferating and making serious appearances at the core of many customers' IS architectures. Some of the most successful of the midrange server vendors are aggressively addressing users' concerns and requirements.

Shrinking recovery time

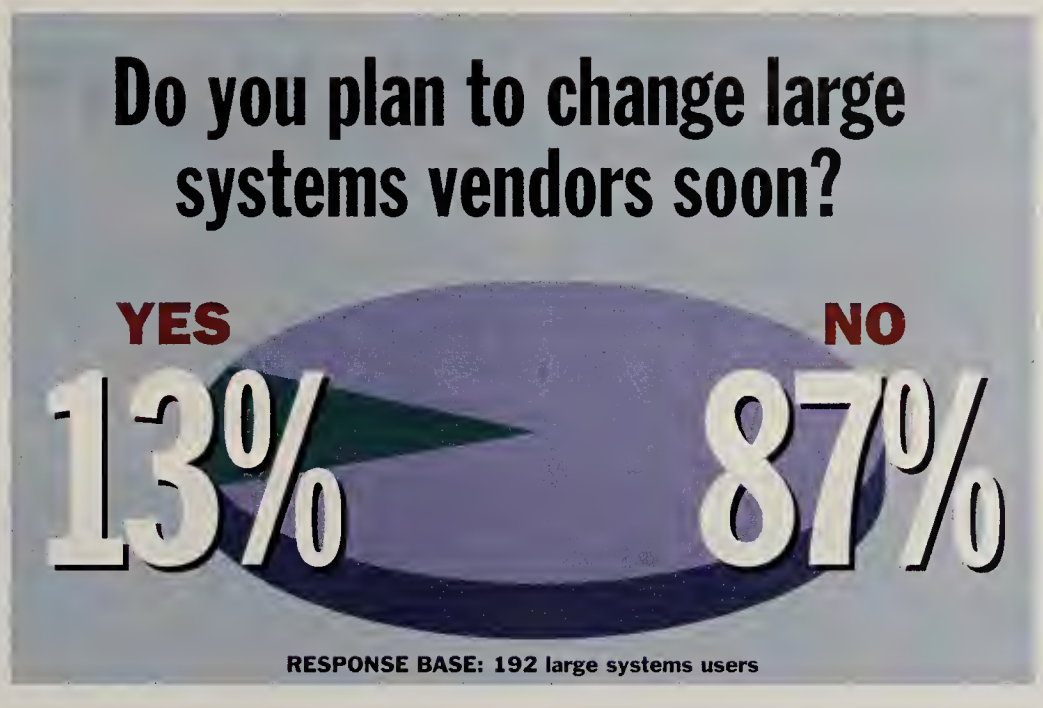
HP is tackling the high availability requirements of users in an aggressive manner. With a recovery time measured in minutes (up to 30 minutes) just a year ago, it was difficult for HP to compete well on the issue of availability. Its plans now call for a recovery time measured in seconds.

The company expects to achieve a recovery time of less than a minute by year's end. HP plans to provide fault resilience to allow continuous availability through automatic failure detection, minimal or no service interruption, multiple systems with takeover capability and on-line configuration maintenance and software changes.

Specifically, HP's offerings include HP SwitchOver and Oracle Parallel Server as well as a journaled file system.

The strongest competitor for mainframe business is the HP 9000 Series 800 system, which is based on HP's PA-RISC chip. The system provides an extensive array of models ranging from low-end desktop models to multiprocessor servers costing upward of $400,000.

Sequent addresses the issue of availability by offering clustering capabilities and redundant arrays of inexpensive disks technology on its Symmetry systems. Superior throughput, versatility and storage access netted the Symmetry 2000, Sequent's latest system, high scores for performance in *Computerworld*'s Firing Line evaluation (see page 122).



While HP has gained a reputation for good systems and network management capabilities, it is not the only vendor to move forward on this front. Sun has also devoted a lot of energy to providing customers with a broad suite of systems management capabilities.

Sun's approach is not only to develop some of the tools internally, but more importantly, to partner with key providers of systems management software, including those from the Unix and IBM/MVS worlds. Partnering with such vendors as Legato Systems, Inc., Computer Associates International, Inc., SAS Institute, Inc., MicroFocus, Inc., Andersen Consulting and Software AG of North America, Inc. provides some legitimacy to the Sun solutions and a certain level of comfort to large legacy systems users. One of Sun's primary alternative mainframe platforms is the SPARCcenter 2000. The system is a multiprocessor, fault-tolerant server that weighs in at about $100,000.

These days users also look to Unix server vendors to provide service and support — not only in the traditional sense of hardware maintenance but also in training, professional services and strategic IS planning — another key feature from the traditional mainframe environment.

Sequent's approach in meeting this user demand was initially developed by its UK office. To gain a foothold in large data center sites, Sequent moved to a major accounts sales program and began offering enhanced service programs.

More to choose from

These service programs included Open Systems Migration Services, the Performance Evaluation Package and the Disaster Recovery Program. More recently, Sequent announced a professional service called Enterprise Architecture Planning Service, wherein Sequent assists customers in aligning their information technology with business strategies so that systems are used to achieve the customer's business objectives.

Midrange Unix vendors have made progress in large data center sites and will continue to find opportunity there by paying attention to the issues of cost, reliability, performance and security. However, mainframes are not dead, and users are not ready to move all mission-critical applications to new platforms.

The reality is that mixed environments of mainframes and Unix servers will predominate in IS architectures for the foreseeable future. ■

Stewart is a senior industry analyst for the client/server computing program at market research firm Dataquest, Inc.

SUN MICROSYSTEMS, INC.'S SPARCCENTER 2000

RESPONSE BASE: 44 USERS

TOTAL SCORE 72

SCORE BASED ON WEIGHTED AVERAGE OF ALL CATEGORIES COMBINED

7.7	Reliability
7.3	Storage
7.0	Technical support
7.3	Operating system
7.3	Throughput
6.2	Cost
7.1	Performance

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy this product again?

38 LIKELY — REASON: MEETS OUR NEEDS/NO PROBLEMS

4 UNLIKELY

2 DON'T KNOW

TOP USER CONCERNS

THE MOST IMPORTANT FEATURES OF LARGE SYSTEMS ARE: (BASED ON A 1-TO-10 SCALE, WHERE 10 IS HIGHEST)

1. **RELIABILITY (9.3)**
   - SYSTEM AVAILABILITY
   - ABILITY TO RECOVER FROM CRASHES
2. **STORAGE (8.6)**
   - SUFFICIENT CAPACITY
   - EFFICIENT ACCESS TO STORAGE MEDIA
3. **TECHNICAL SUPPORT (8.5)**
4. **OPERATING SYSTEM (8.4)**
   - EASE OF USE
   - FUNCTIONALITY
   - AVAILABILITY
   - ABILITY TO PROVIDE SECURITY
   - ABILITY TO MANAGE COMPLEX APPLICATIONS
5. **THROUGHPUT (7.9)**
   - I/O CAPACITY
   - SPEED OF I/O
6. **COST (7.7)**
7. **PERFORMANCE (7.2)**
   - ON-LINE TRANSACTION PERFORMANCE
   - DECISION-SUPPORT PERFORMANCE
   - BATCH-PROCESSING PERFORMANCE

of use in the survey.

Sun's SPARCcenter 2000 trailed both the mainframe and the HP Series 800 by a large margin, although like the HP systems it outscored the mainframe in functionality of operating system and decision-support performance. The SPARCcenter's biggest weakness in the survey was its technical support score — and SPARCcenter users rated that particular area as even more important than did mainframe users.

The survey also collected customer feedback for three other downsizing systems: the HP 9000 Model T500, Pyramid Technology Corp.'s Nile and MIS Server systems and Sequent Computer Systems, Inc.'s Symmetry 2000 series. The results are not included in the Scorecard charts because each of these systems yielded a response base of less than 30 users. Nevertheless, the results are interesting.

The HP 9000 Corporate Business Server T500 is a PA-RISC-based Unix system that can include up to 12 processors. Among the alternative systems surveyed, the T500 alone outscored the ES/9000 overall; it was particularly strong in the areas of cost and performance. It tied the ES/9000 in vendor technical support and placed slightly below the mainframe in reliability.

Pyramid's symmetric multiprocessing systems earned roughly the same satisfaction rating overall as the mainframe, finishing much lower in reliability and technical support but much higher in cost, I/O speed and decision-support performance. Both Pyramid and the HP T500 tallied higher satisfaction than the ES/9000 in the ability to handle complex application demands.

Most of the respondents were using systems from the newer Nile series, which Pyramid recently expanded with additional low-end models.

Sequent's servers earned lower overall satisfaction, approximately in line with the Sun SPARCcenter 2000's scores. Sequent's best scores were in reliability and availability.

Contact information

IBM, Armonk, N.Y. (800) 426-3333/(914) 765-1900; Hewlett-Packard Co., Palo Alto, Calif. (800) 762-0900/(415) 857-1501; Pyramid Technology Corp., San Jose, Calif. (800) 289-7973/(408) 428-9000; Sequent Computer Systems, Inc., Beaverton, Ore. (800) 854-0428/(503) 626-5700; Sun Microsystems Computer Corp., Mountain View, Calif. (800) 821-4643/(415) 960-1300. ■

Slater is an assistant editor, features.

Sequent Symmetry 2000

Strong on speed, but users dislike price

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ *The Sequent Symmetry 2000 series of symmetrical multiprocessing systems provides outstanding throughput and versatility, according to evaluators.*

■ *They also said the series has a stiff entry cost that can be reduced as experience grows.*

Released last fall, the Sequent Symmetry 2000 series, from Sequent Computer Systems, Inc. in Beaverton, Ore., comprises four Unix systems based on Intel Corp. Pentium processors. With a symmetrical multiprocessing (SMP) architecture, the Symmetry 2000 series is suitable for a range of computing tasks formerly handled by mainframe hardware.

Two platforms in the series — the 2000/490 and 2000/790 — fall in the center of the Symmetry 2000 product line. The 2000/490 can be equipped with two to 10 Pentium chips and up to 768M bytes of memory; the 2000/790 handles up to 30 Pentiums and as much as 1.5G bytes of RAM.

Both systems provide up to 200 MIPS per processor board, according to Sequent benchmarks. Evaluators were unable to provide anything other than anecdotal benchmarks due to the SMP architecture of the machines and varying configurations.

Participants in this evaluation included technical and management staff from an entertainment services firm, a petroleum company, a financial firm and an educational institution.

The format for this evaluation was created with assistance from Howard Rubin Associates and Technology Investment Strategies Corp.

Availability

The architecture of Symmetry 2000 includes load-balancing features that distribute tasks across multiple processors. In addition, all processors share the same memory and a 64-bit bus.

Educational institution: "There is no downtime because it's hot-swappable."

Crash recovery

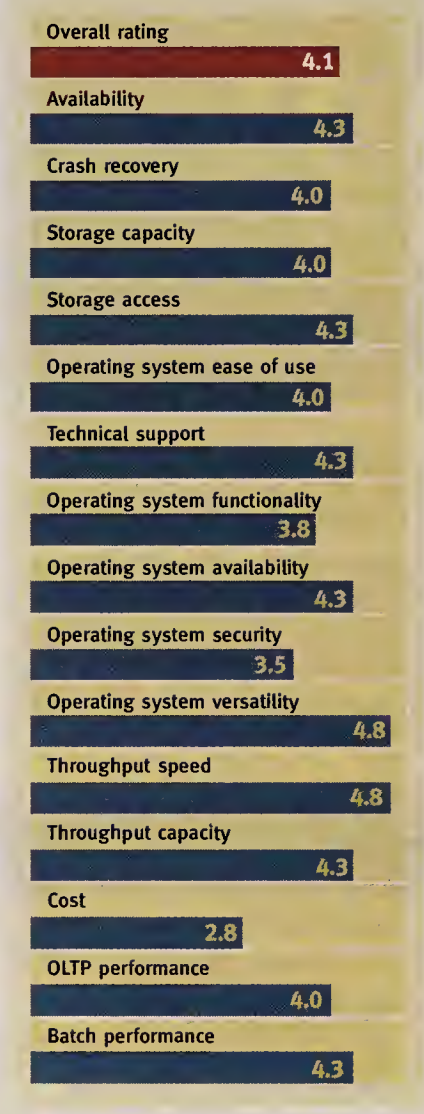
Symmetry 2000 includes a Diagnostic Executive monitor that evaluators said decreased problem-solving time.

Evaluators also said Sequent technical staff was able to solve problems remotely, reducing recovery time. They said crashes occurred infrequently.

Entertainment services firm: "Our worst was when it was down 1½ hours, but that's over five years. We had it on-line in five to 10 minutes, and the rest of the time was the recovery phase."

Sequent Symmetry 2000

Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users.



OLTP performance

All of the evaluators made extensive use of Symmetry 2000 for on-line transaction processing (OLTP) applications. They concurred that its SMP architecture made the system an excellent choice for that task.

Financial firm: "A couple of seconds is fairly good [response time], but it could always be better. There is no way to satisfy anyone in OLTP."

Throughput speed

The evaluators were unable to provide definitive benchmarks for Symmetry 2000. However, they agreed that it provided outstanding throughput.

The petroleum evaluator was replacing an IBM 3080 mainframe with a Symmetry 2000/790. "It's hard to compare [throughput] with anything else because the bus is different than anything we've seen."

Storage capacity

Symmetry 2000/490 can scale to 400G bytes of storage, Symmetry 2000/790 up to 800G bytes. The evaluators said this was more than sufficient for their current needs.

Petroleum firm: "The storage is effectively unlimited. You can hang as much from it as you have money to spend."

Storage access

Sequent offers two controllers for the Symmetry 2000. Both are SCSI-2 and offer 8- or 16-bit data paths.

Financial firm: "I can't conceive of anything being better because it internally clusters data."

Operating system ease

Sequent provides a Unix variant called Dynix/ptx with Symmetry 2000 systems. Based on AT&T System V, Dynix/ptx is compliant with both Posix and most Unix standards. The kernel was designed to support the Symmetry 2000 multiprocessing architecture.

Petroleum firm: Sequent "is changing the interface and making it easier, but it now runs just like our mainframe with menus. It's easy to migrate mainframe operators to it."

Technical support

Evaluators said Sequent technical support was excellent. The company offers a range of support plans from remote software updates to on-site engineers.

Petroleum firm: "When they come in after the purchase, [technical support] is more than you can imagine. They are right there to get it installed."

Cost

Evaluators concurred that Symmetry 2000 was more expensive than other high-end Unix offerings. They added that the initial learning curve was somewhat extended, making the system even more costly.

Educational institution: "The Sequent is overpriced in some respects. It's not the easiest machine to buy." ■

Written by Computerworld *senior editor Garry Ray.*

Sequent responds

Sequent spokesman Mike Green responded to issues raised in this evaluation.

Operating system: Over the years, we have put priority on the scalability, performance and throughput of our operating system, while ease of use and related attributes have not been as high on the list. Customers will see changes in terms of administration and usability in the fourth quarter of 1994.

Costs: We know we may be higher priced than systems nominally similar in a pure price comparison. However, we provide a lot of value-added in terms of sales support and technical support. That leads to high customer retention. We work hard to deliver value to customers. That is our primary goal.

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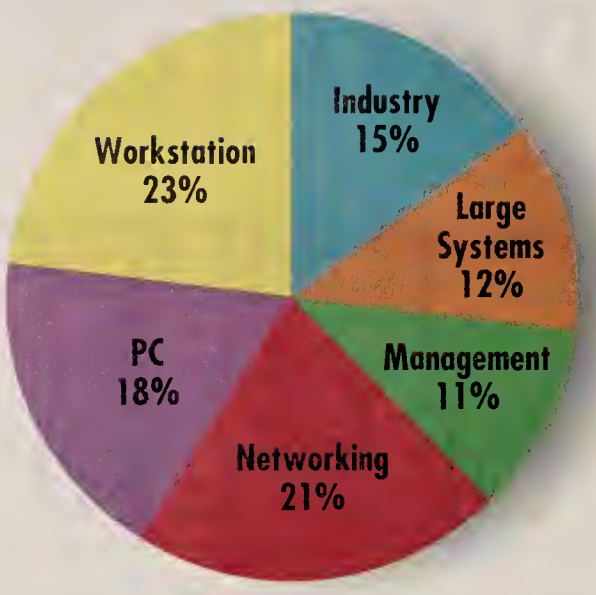

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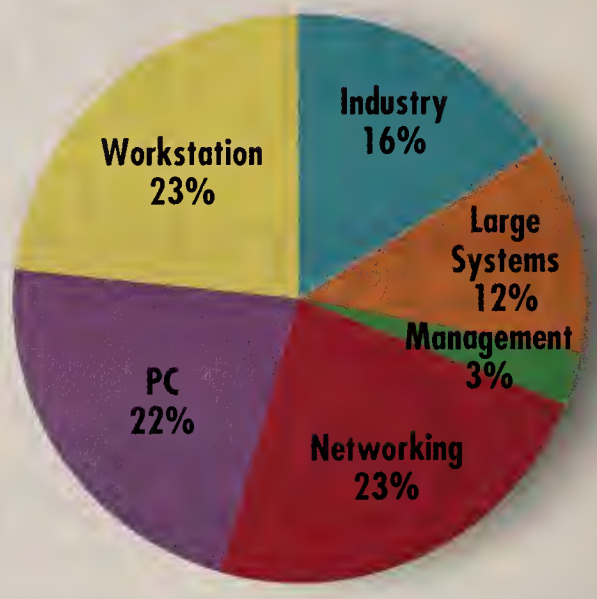

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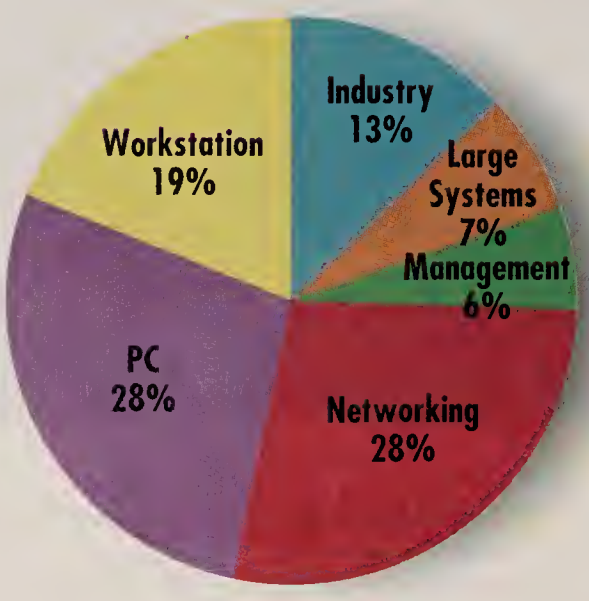

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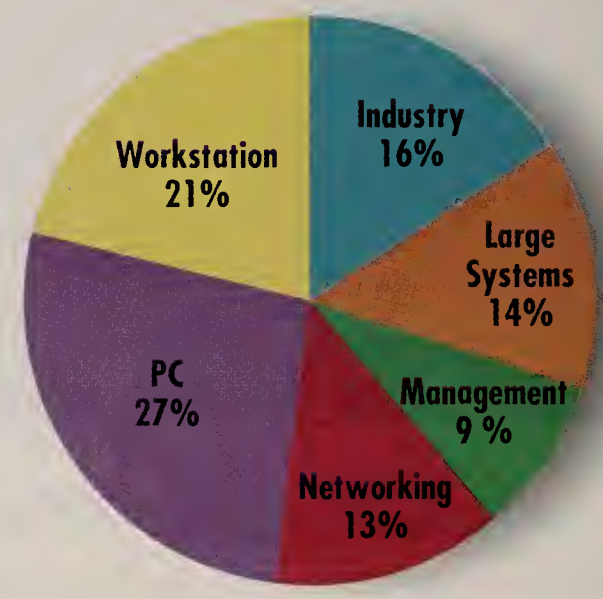

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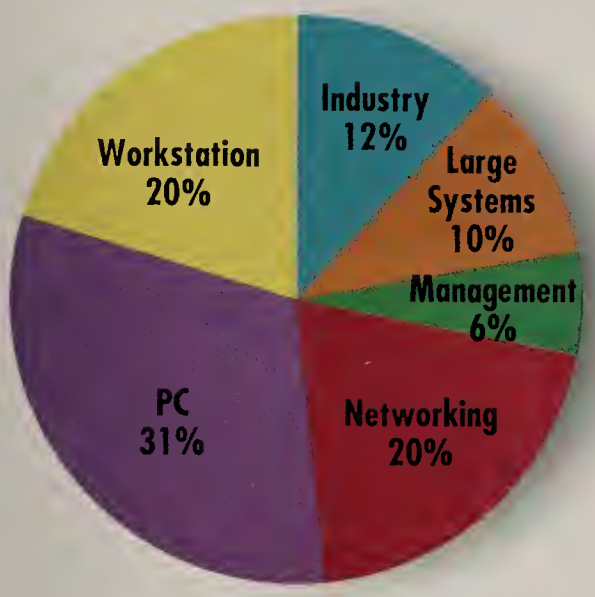

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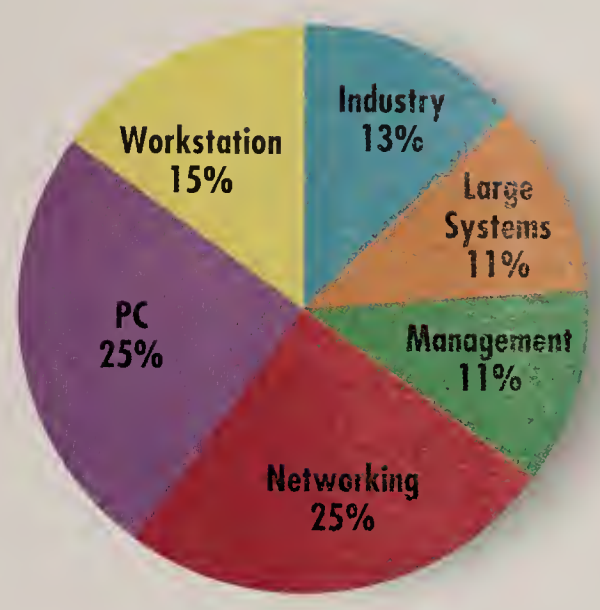

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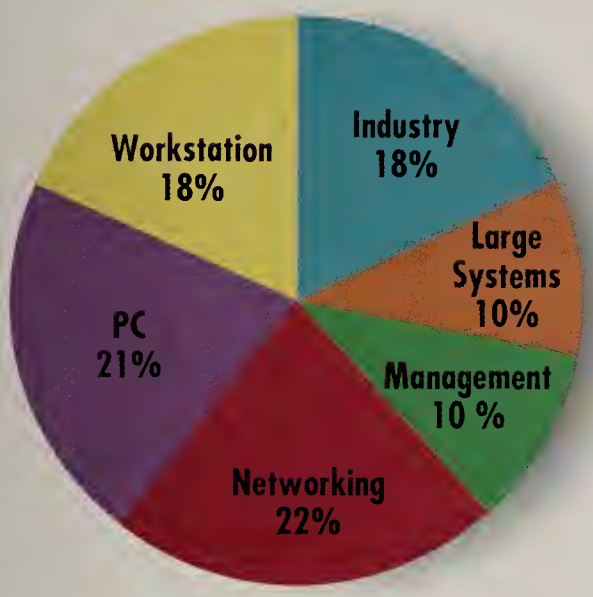

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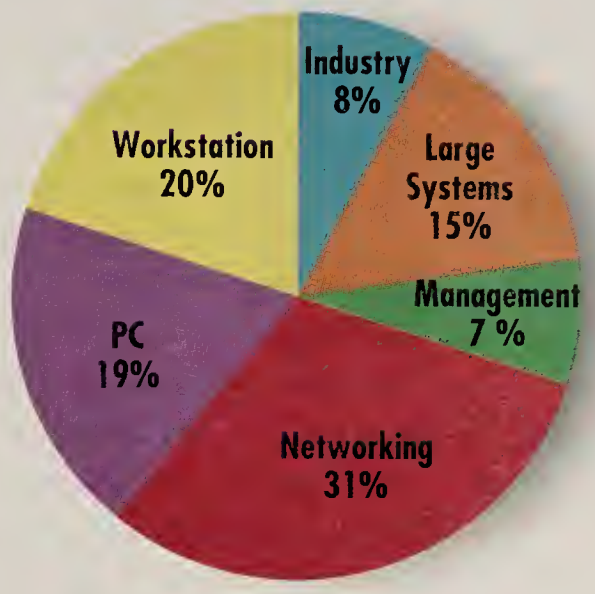

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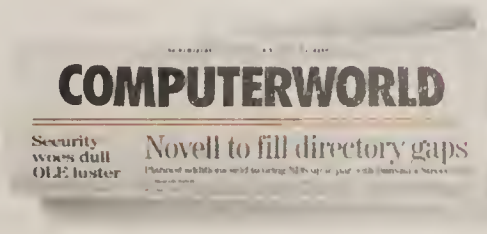

The Newspaper of IS

Maybe we should tell you how we helped some really famous company get to the client/server platform.

(And we could show you pictures of our kids too.)

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Mainframe musts

Make sure you ask these questions before leaping to a "new" large system alternative

Although they are aimed at providing competitive, open alternatives to traditional systems, new offerings from IBM, Unisys and other vendors are mainframes at heart. This, depending on the user's point of view, is either an asset or a detriment. The real attractiveness of these offerings depends on specific factors in the environment. When evaluating platforms for database query or OLTP work loads, users should consider the following factors:

What is the price/performance?

This issue must be considered in terms of the total configuration, including any traditional system that is connected. ES/9000 upgrades, channel-to-channel adapters, additional Escon channels, additional direct-access storage devices, coupling facility and links or an XPC may be required if work load balancing and resource sharing with other traditional mainframes is desired.

This evaluation is complicated by the fact that IBM is offering PQS and PTS only in special packaged bids, which include hardware, software and support services for the installation. IBM did not publish list prices for the PTS.

However, feedback from customers who have received early bids from IBM indicate PTS is being priced in the range of $24,000 to $27,000 per MIPS, excluding software. IBM appears to be targeting PTS prices at about 20% below ES/9000 prices this year. This may not be sufficiently attractive compared with some of the alternative platforms to encourage users to implement new applications on what is, after all, another mainframe.

PQS, PTS, Amdahl's Xplorer and Unisys' DataCentral are priced reasonably compared with traditional mainframes. Market acceptance may produce price reductions and force alternative platform vendors to reduce prices to remain competitive.

What are the support skills?

For most traditional data centers, systems programming, operations and applications development staffs have strong mainframe experience, including operating systems and major subsystems (for example, CICS, QMF and Mapper) and end-user facilities (for example, PAS, DIS, SAS, Focus and Nomad).

Implementing a new platform architecture may require extensive training or hiring. Training should be quantified; support requirements and staff productivity must be estimated.

What is the development effort?

PQS and Xplorer, for example, run vendor-supplied software for their control programs and database management systems. Application software runs on the host mainframe.

Many existing host-based inquiry applications can use them with little or no modification. Development timing and the amount of effort required by a new application using PQS, PTS, Xplorer or DataCentral can be reasonably estimated based on staff skills and experience.

Developing an application for a new platform is impacted by the degree of training required.

What availability is required?

PQS, PTS and Xplorer are structured internally with multiple processors; if any processor fails, the other processors continue to function.

In the case of PQS and PTS, even if all processors in the server fail, the work load can be executed on the traditional mainframe system.

However, if the application is implemented on another platform architecture, a platform outage would likely result in an application outage.

What is the strategic direction?

A new application that uses PQS, PTS, Xplorer or DataCentral can be considered a mainframe application and may not conform to IS' objectives or management directives. This emotional factor may outweigh all others and can, for example, make Xplorer's Oracle database more attractive than the DB2 database in PQS.

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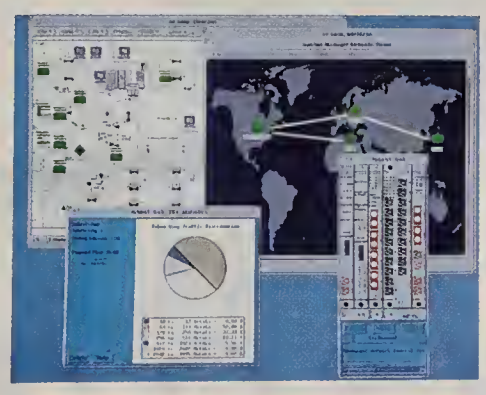

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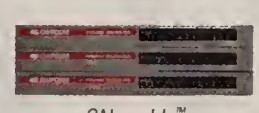

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ONE *on* ONE *with* Jaron Lanier

JOHN RAE

Look beyond combat theme parks, Star Trek *and $99 Windows packages. Virtual reality has a lot to offer IS pros, says VR guru Lanier.*

By Joseph E. Maglitta

Sales of virtual reality devices will grow from $84 million in 1992 to $1 billion by 1997, predicts researcher Frost & Sullivan.

AMONG FICKLE TECHNOLOGY professionals, yesterday's "Whoa!" can quickly become today's "So?" Take virtual reality and its most colorful promoter, Jaron Lanier.

A decade ago, techies and dreamers alike were wowed by virtual reality's science-fiction promise. Today, the daydream is mainstream.

Lanier himself has also gone more mainstream, despite his dramatic dreadlock hairstyle. During the last couple of years, he's transformed himself from an underground icon into a cyberage Renaissance man.

Currently, Lanier is involved in a fantastic palette of projects, ranging from advising two surgical virtual reality start-ups to composing an opera to publishing a new book and original music on CD. He is also teaching at Columbia University and New York University (see story at right).

"I enjoy the diversity of things," explains Lanier, 33, with characteristically soft-spoken humility.

Two years ago, Lanier left daily business pressures behind by selling VPL Research, Inc., the pioneering virtual reality company he founded in Palo Alto, Calif. (VPL filed for Chapter 11 last summer. Lanier and VPL remain tangled in lawsuits.)

Leaving behind the day-to-day grind has enabled Lanier to focus afresh on one of his original interests: using virtual reality to improve software programming and maintenance.

In the 1980s, Lanier conceived Embrace, a hieroglyphic programming language. The effort stalled ("It felt kind of alien," he reflects) and went into limbo at VPL.

Undaunted, Lanier, the computer scientist, today continues to help information systems professionals look beyond the entertainment aspects of virtual reality.

Lanier, *page 132*

REAL *virtual reality*

Virtual reality technology that can be used by information systems professionals is being pieced together in laboratories and companies around the world. Here is a sampling of recent notable developments:

on site

▶ **BT LABORATORIES** (formerly British Telecom) in Martesham, England, uses virtual reality software for displaying the structure of its international voice, data and video telecommunications network. The system generates 3-D interactive graphics showing nodes and links of the system's 6,000 exchanges and 25 million customer lines. Technicians can navigate the network and receive high-level or detailed views so they can troubleshoot and reconfigure the net more easily.

▶ **LONG ISLAND LIGHTING CO.** this month expects to begin production of a 7-pound wearable computer that places a display screen in front of a field service technician's eye. The Intel 486-based device eliminates the need for technicians to carry paper repair and maintenance manuals. Co-developer is AIL Systems, Inc. in Deer Park, N.Y.

▶ At last month's Networld/Interop Show in Las Vegas, **CABLETRON SYSTEMS, INC.** used a form of virtual reality called "immersive animation" to demonstrate its new switching hub. Visitors to a 26-seat virtual reality theater donned head-mounted displays and were "virtually transformed" into data packets traveling through the system at high speeds.

▶ A virtual reality software tool for visualizing multidimensional data was introduced by **AVATAR PARTNERS, INC. MAXUS SYSTEMS INTERNATIONAL, INC.** unveiled a virtual reality product that lets users control real-time information feeds and 3-D data. The package translates spreadsheet and table data into 3-D symbols that expand, shrink, blink and spin. Both companies are targeting the products at stockbrokers.

in progress

▶ **THE GEORGIA INSTITUTE OF TECHNOLOGY** is exploring how virtual reality can be used for data analysis and applications. Its object-based approach lets users manipulate data interactively.

▶ A tool that can visualize an entire library is under development at the **UNIVERSITY OF MARYLAND'S COMPUTER-HUMAN INTERACTION LABORATORY.** Lab director and graphical user interface innovator Ben Schneiderman says the nonimmersive virtual reality system will let users filter out specific items and zoom in on desired topics at speeds of 100 milliseconds without a keyboard.

▶ **TOKYO UNIVERSITY** Professor Michitaka Hirose expects to begin selling a new software visualization system by 1996 or 1997. Backers say the product could reduce programming time by up to 50% and speed debugging and maintenance. A recent Institute of Electronics and Electrical Engineers, Inc. report estimates that Japanese companies, universities and government-sponsored groups are now engaged in 100 large and small virtual reality research projects and studies.

▶ Information visualization using virtual reality has been prototyped at **NASA AMES LABORATORY.** Users experience themselves inside a database. Hand and body motions let users organize or select information, which can be overlaid on the real world. Possible applications: electronic notes, floating markers and instructions.

Jack Boyles
Computerworld Reader
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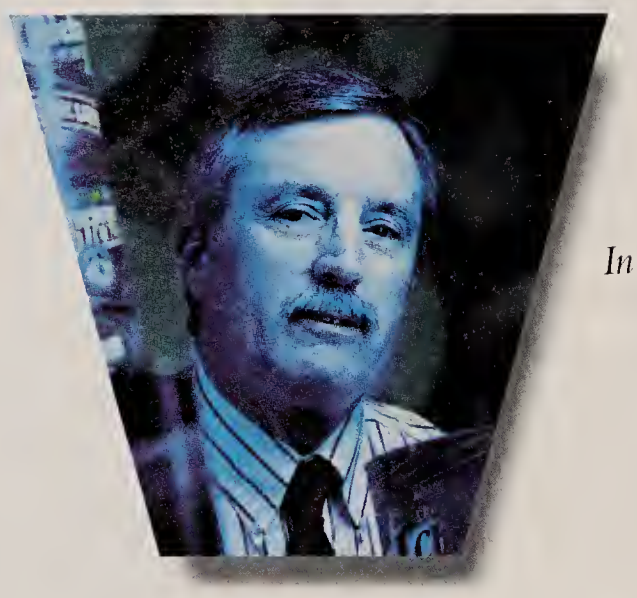

In the information market, this much is clear: Vendors make the products. IS managers make the decisio

≈ Van Camp Seafood has made its mark producing "Chicken of the Sea," some of the finest tuna and salmon sold today. But due to the intense demand and subsequent volume they were doing, they found the need for a software set-up to help keep an eye on all the facets of their company. Especially product pricing. Because if pricing isn't current, there could be some unhappy customers. And that could result in somebody getting canned. ≈

≈ In this instance, Computer Associates took the bait. With their knowledge of the seafood industry and enterprise wide solutions, they had no trouble designing a system to make Van Camp Seafood more efficient. Now they can offer a high level of customer service while controlling their sales, inventory and distribution—including the all-important price flexibility. So, the way Van Camp Seafood sees it, Computer Associates was the catch of the day. ≈

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Continued from page 129

It has been a tough sell. Despite growing business use — notably in design and manufacturing — most IS professionals regard virtual reality as a toy technology. Few know more than the basics of the concept, let alone how it might help their craft.

It hasn't helped that virtual reality has been embraced by the entertainment industry. Virtual reality has been featured on recent television episodes of *Mad About You*, *Wild Palms* and *Star Trek: The Next Generation*. The Virtual World Game Center in Walnut Creek, Calif., and other virtual reality arcades are starting to dot the country; dozens more are planned. One software maker, Virtus Corp. in Cary, N.C., recently introduced a $99 virtual reality package for Microsoft Corp.'s Windows 3.1.

EVEN SO, LANIER IS relying on an ingratiating blend of social conscience, dramatic flair and gentle brilliance to bring virtual reality technology back home to technologists.

His vision is as important as — perhaps more so than — any products he might generate. Indeed, some of the new approaches and notions he and other virtual reality visionaries speak about are already turning up in research labs and a handful of businesses and products (see story page 129).

"If you want people to remember a complicated thing," says Lanier, a New Mexico-bred high-school dropout, musician and former video game programmer at Atari Corp., "you want it to be kind of quirky."

He's talking about designing virtual reality scenes, but it's a philosophy that IS professionals might take to heart in many areas.

Computerworld senior editor Joseph E. Maglitta spoke recently with a virtual Lanier by telephone from his New York apartment.

when does he SLEEP?

Since leaving VPL Research, Inc., the pioneering virtual reality company he founded, Jaron Lanier has hardly been idle. Here's a rundown of some of his current roles:

- ▶ **CHIEF SCIENTIST** for New Leaf Systems, a California start-up company, developing software authoring tools for virtual reality-based surgery. Lanier also serves as co-chairman at Medical Media Systems, a start-up company based at Dartmouth College.
- ▶ **RESEARCHER** studying surgical simulation under Advanced Research Projects Agency (ARPA) funding.
- ▶ **DEVELOPER** of virtual reality-based attractions for an unnamed entertainment firm.
- ▶ **VISITING SCHOLAR** at Columbia University focusing on computational complexity.
- ▶ **TEACHER** at New York University's film school program on artistic design of virtual worlds.
- ▶ **AUTHOR** of a new book on virtual reality due out soon by Harcourt Brace Jovanovich, Inc.
- ▶ **COMPOSER AND PERFORMER** of *Instruments of Change*, a new classical-style Polygram CD featuring original compositions for acoustic world instruments.
- ▶ **MANAGEMENT CONSULTANT.**

BORDERLESS Programming

I GOT INVOLVED IN VIRTUAL REALITY in the first place out of a belief that we needed more and more rich user interfaces, such as a borderless, 360-degree screen, to help programmers deal with complexity.

It's very, very hard to cram a picture of something complicated onto a little screen. You can try all the scrolling and overlapping you want, but you still are stuck with that little tiny periscope into a [very complex] world.

Beyond that, there's the notion of having true three dimensionality where you can look around corners so you don't have to design solely a 2-D presentation. All of a sudden, you have this enormous amount of flexibility.

CITIES *and* CODE CAVES

I HAVE THIS SENSE THAT, IN THE future, programs will be sort of big cities you can walk around in and crawl around in to connect. These will not be little programs but big programs — somebody running a worldwide health care database, for instance.

Doing that with current technology is actually just about beyond the envelope of the possible.

Two people can be inside a space and understand it the same way they can understand being in a cave together. That's remarkably important because facilitating collaboration is key to managing complexity, especially over time.

This helps avoid the classic situation in which some team finally manages to make this complicated program run, and as soon as it has to be modified, a new team spends 10 times as much time figuring the program out.

Beyond PARSERS *and* TEXT

THE USER INTERFACE HAS TO BE more critically a part of the very fundamental design of the language than it [currently] is. The reliance on text as the primary representation mechanism for algorithms creates confusion. I think there are a number of reasons for that, among them the use of parsers to decode very complicated things.

I believe that parsers are bad and that text, which is magnificent for many representational purposes, is not good enough to be relied upon as a primary representation for large programs.

You can say we're going to make a virtual reality interface for the C++ language or something. That's ridiculous. C++ is already infected; it uses parsers. It's already fundamentally a text thing. You have to start over from scratch.

Of PIANOS *and* PROGRAMMING

EVENTUALLY, PROGRAMMING HAS TO be considered a task of both the mind and the body for the reason that human performance is optimized in such cases.

Look at somebody programming at a workstation. Watch the rate at which they do things, the level of complexity they are managing. Now look at somebody playing piano and compare the two. An improvising pianist is coping with a level of complexity that is very substantial and doing it much faster.

What's the difference between these two people? Essentially, computers, as they are currently conceived, don't allow for the type of virtuosity of which people are capable. I believe that you have to bring the body into the picture.

When you're programming, you have to be able to tweak a little bit and do an incremental test to get a program right. How do you get feedback for that in VR?

One of the intriguing uses is to have intensively fast real-time tweaks in programs. You could get your hands on a program that would essentially feel like a physical thing and start playing with it.

You would have the same degree of feeling that you would have, say, when you are adjusting a carburetor. There is an immediate combination of tactile, sonic and visual cues that help you understand what you are doing.

FULL-BODY AUTHORING

THE ACT OF PROGRAMMING ITSELF has to be some kind of hand/eye thing in

Lanier, *page 134*

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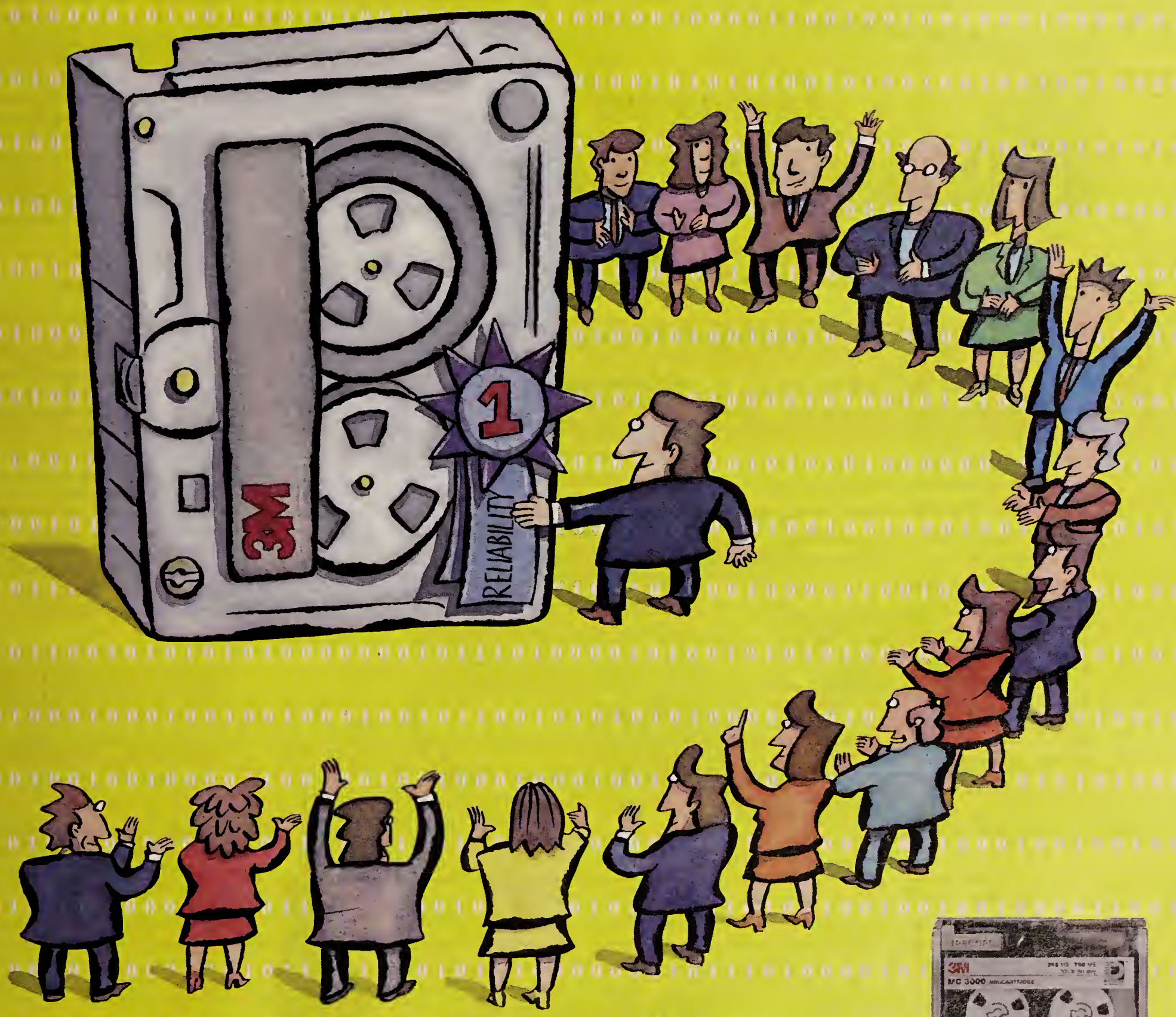

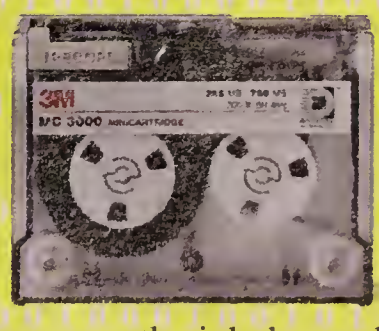

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3M *Reliability*

Continued from page 132

which you're playing with widgets in your hands. That's our most powerful cognitive mode for manipulation. When [programmers] program, when they actually change [the program] as opposed to navigating through, it might become small. It might be something in their hands they are clicking on.

I believe that we face many, many years of work to make something like this happen.

Mediocre HARDWARE *and* SOFTWARE

EVERYBODY FOCUSES ON WHETHER virtual reality hardware is any good, whether the graphics rendering is any good, whether the head-mounted displays are any good. The answer is that they are just sort of at the point of being OK. Most virtual reality software I've seen is very poor. I think it's a great struggle to do it well.

Infobahn PROBLEMS

I'M A LITTLE BIT CONCERNED ABOUT some proposals I am seeing for the super highway — whatever that is exactly. They might leave the virtual reality world out. Some of the nets that have very high bandwidth actually harm response time of virtual reality systems. For us, it's actually a step backward.

Most of the concerns about network infrastructures are that they don't really allow for virtual reality. [That's because today's networks] focus on bandwidth rather than time lags for information packets. We like bandwidth, but we care much more about reducing lags.

Say you set up a pipe between two [hospital] sites. One site sees data on somebody's heart, the other is moving a scalpel around. It's a continuous process. In current architecture, most of the ideas are based on sending packets around. If packets happen to arrive late or out of order, that's not acceptable.

Tips FOR IS

I FEEL LIKE I SHOULD ISSUE A SORT of "buyer beware" warning. There are a whole lot of entrepreneurs in the virtual reality field who figure that because everybody wants information and access to virtual reality, they ought to be able to make some money off that desire.

There's a whole bunch of virtual reality conventions and virtual reality marketing newsletters and virtual reality glossy magazines, virtual reality T-shirts and tea kettles and whatever. You want to watch out for these things. Most of them deliver very little value. ■

RESOURCES

▶ **SILICON MIRAGE** by Steve Aukstakalnis and David Blatner (Peachpit Press, Berkeley, Calif., 1992).

▶ **VIRTUAL REALITY THROUGH THE LOOKING GLASS** by Ken Pimental and Kevin Teixeira (Intel/Winderest/McGraw-Hill, 1993).

▶ **"CYBEREDGE JOURNAL"** (Sausalito, Calif.). Bimonthly newsletter includes news, business reports, book reviews, conference reports. $129/year. (415) 331-3343.

▶ Special Interest Group on Computer Graphics (**SIGGRAPH**) Smith Bucklin & Associates. (312) 321-6830.

▶ **VIRTUAL REALITY AND DISABILITIES CONFERENCE.** (818) 885-2578.

▶ **"VIRTUAL REALITY REPORT."** Monthly newsletter, $337/year. (800) 632-5537.

▶ **VIRTUAL REALITY WORLD.** Monthly magazine, $59/year. (203) 226-6967.

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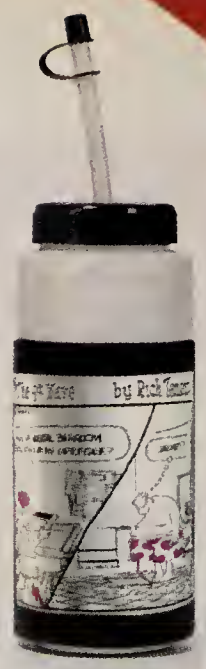

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"To generate sales for Across the Boards, a communications toolkit for developing cooperative applications, and pcMAINFRAME, a generalized micro-to-mainframe file transfer system, cfSOFTWARE has been advertising in *Computerworld Direct Response Cards* almost from the very start. Now, based on our past success, we've also started to advertise pc2POWER, our newest file transfer system. Since all of our products facilitate mainframe-to-micro communication, we need to reach IS managers and technical support professionals on the mainframe side as well as end users on the PC side. That's why *Computerworld Direct Response Cards*, with their large audience of buyers most apt to need our products, are one of our primary advertising vehicles.

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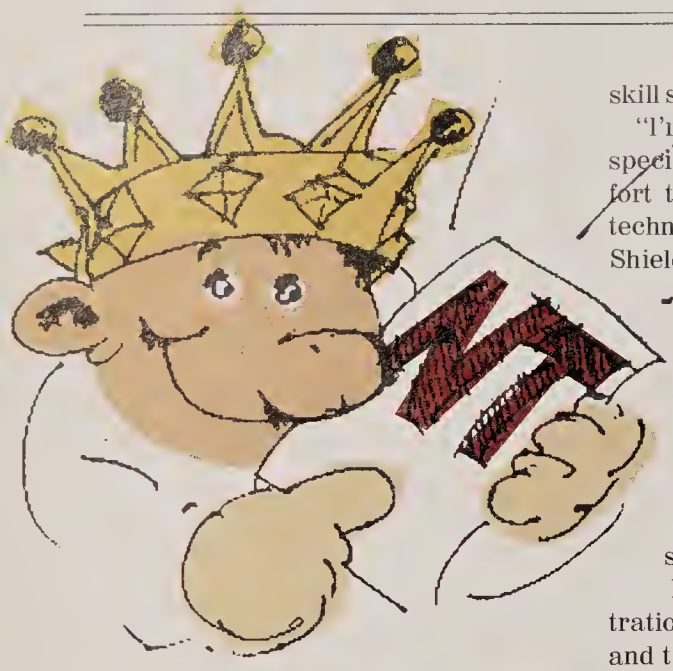

Calling *the* shots

A scarcity of experts skilled in Windows NT has employers safeguarding their on-staff talent

By Bronwyn Fryer

While the demand for Microsoft Corp. Windows NT specialists is unlikely to come close to the current need for Novell, Inc. NetWare administrators, companies making NT a building block in their information systems plan are ponying up to find people with the necessary skill sets.

"I'm willing to pay more for an experienced NT specialist because it costs too much in time and effort to retrain," says Richard Boone, manager of technical services at King's County Medical/Blue Shield in Seattle.

Boone, who successfully lured a former NT test team member to his company from Microsoft, is possessive about his staff. "I have to be careful to keep my staff because the market is sucking up the resources."

NT is still in its first incarnation, but its ease of use and performance is promising enough that companies believe it will figure significantly in future environments.

Furthermore, those interested in NT administration should have an understanding of Windows and take the two widely offered Microsoft-certified courses, advises Tim McKamey, a LAN administrator in Boone's department.

McKamey, who helps oversee 15 NT application servers, suggests learning to use NT in a test setting, rather than in a production one, to prevent mishaps. "Other operating systems keep you from getting too deeply under the hood," he notes. "But NT throws all the doors open, so you have to tread carefully."

Because NT is fairly new, NT administrators are often perceived as forward-looking technologists who take an active part in the technology, rather than as fire-chasers — a position that frequently plagues specialists in NetWare. "I don't pay our NT administrator to baby-sit the network but to help see where the business is going and to do things — like link it to the Internet — that make it useful for users," says Pharid Jaffer, IS director at George Weston Ltd. in Toronto.

Opinion varies on how much baby-sitting NT networks require, however. Many IS personnel say NT will demand too much time to work out incompatibility, security and other issues. Others, especially those without strict security requirements, say NT doesn't demand the kind of attention that NetWare requires.

"On a day-to-day basis, performance and ease of use are excellent," notes Boro Marinkovich, manager of advanced technology at George Weston. "NT is much easier to maintain than a Novell network." ■

Fryer is a free-lance writer in Menlo Park, Calif.

Its time will come

The installed base of Windows NT is expected to grow from 268,000 last year to 3.7 million by the end of 1997. Though many of these licenses will be for single-user PCs, there will be an increasing need for people with administrative and support skills, says David Smith, director of advanced operating system research at International Data Corp. in Framingham, Mass.

Moving from 'LanMan'

Companies that are particularly interested in consolidating their desktop and server applications under one graphical roof are beginning to install Windows NT Advanced Server in corporate workgroups.

At George Weston, NetWare is being phased out in favor of NT in an effort to provide Windows consistency across both clients and servers. "We want a graphical user interface-based operating system, not just something that's been ported over," says Pharid Jaffer, IS director.

In addition to a large number of Novell-based LANs, the company runs seven NT Advanced Server servers supporting 120 active clients; 250 additional users have access to the servers.

The servers, which previously ran Microsoft's LAN Manager, were switched to NT late last year when George Weston became an NT beta site. Installation and implementation of NT fell to Boro Marinkovich, manager of advanced technology, who relied on his background in NetWare and LAN Manager, as well as on two Microsoft-certified courses on NT. Marinkovich says his LAN Manager experience stood him in good stead. "It's a pretty smooth move from 'LanMan' to NT," he notes. But without such experience, the learning curve can be steep. "If you come from the NetWare world, you're used to working with completely different directory services and security concepts," Marinkovich says. In addition, the NT model is domain-based, so the administrator must learn a different way to manage the servers.

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Think you've got it bad?

BY MICHELLE LOUZOUN

Your worst possible nightmare has come true: Your boss told you he's changing your position to a job you detest.

What's the worst information systems job you can possibly imagine? We posed this question to 361 IS professionals from various companies. For many respondents, the answer was mood-related: Depending on the day, it could be all jobs or none of them. Even so, respondents didn't hold back. Of those polled, 30% said the worst IS job was working on the help desk or in a troubleshooting position.

And for good reason — they say it's almost impossible to do. "I worked on the help desk for three months, and I felt helpless," says Jeanette N. McClintick, a technical development manager at Inland Container Corp. in Indianapolis. "I spoke to unhappy users and had a great deal of trouble getting the resources to fix their problems."

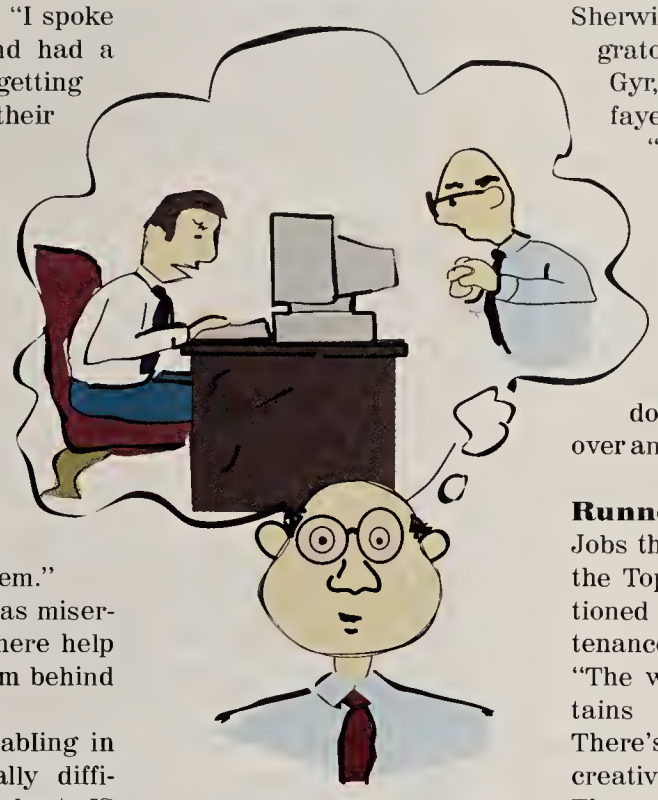
The downside, the respondents say, is that users often don't understand how hard you're trying. "People can be insistent," McClintick says. "They'll call you back two and three times. They're not even aware that you're doing anything to help them."

Life can be equally as miserable at companies where help desk staff get out from behind the desk.

"Troubleshooting cabling in particular is especially difficult," says Gary Reichert, IS manager at St. Joseph's Rehabilitation Center in Saranac Lake, N.Y. "You never know if the problem is with the PC and the wall jack, the hub and the punchdown block, or the punchdown block and the wall jack," he says. "It's a very frustrating and time-consuming job."

Second in line for worst-job honors is programmer/analyst. Like help desk staff, many programmer/analysts find it difficult to please the people they work for.

"Nothing you do is what the users asked for, no matter how closely you follow specifications," says Darline Richards, a network manager at Textile, Rubber & Chemical Co. in Dalton, Ga. "Even when you write something that everyone agrees with, you see something that could have been done better. You never feel that you're finished with the project. It's very frustrating."



Third place goes to computer operators, especially the third shift, says Major W. Sherwin, systems integrator at Landis & Gyr, Inc. in Lafayette, Ind.

"That's the person who backs up the database, prints out reports and then separates them," he says. "You do the same thing over and over again."

Runners-up

Jobs that didn't make the Top 10 list but were mentioned included software maintenance and systems design. "The worst is one that maintains the legacy systems. There's very little chance to be creative or add value," says Thomas N. Berard, IS manager at Forster, Inc. in Wilton, Maine.

"By the time a maintenance programmer inherits a system, its already spaghetti code," adds Terry Hare, IS manager at Notions Marketing Corp. in Grand Rapids, Mich.

"System design is a horrible job. It's hard to figure out exactly what you want to accomplish. There's a lot of second- and third-guessing," says Aaron B. Eckard, IS manager at Trans Metrics, Inc. in Solon, Ohio. "I thought I was going to get an ulcer."

Louzoun is a free-lance writer in New York.

WORST IS JOBS

Computerworld polled 361 information systems professionals in a variety of different positions on which IS job they hate most

		(percentage of respondents)
1.	Help desk/troubleshooter	30%
2.	Programmer/analyst	17%
3.	Computer operator	12%
4.	IS manager	11%
5.	Network manager	7%
6.	Vice president/CIO	6%
7.	Hardware support	5%
8.	LAN administrator	4%
9.	Mainframe programmer	4%
10.	Budget director	4%

Source: Computerworld Database Division, Framingham, Mass.

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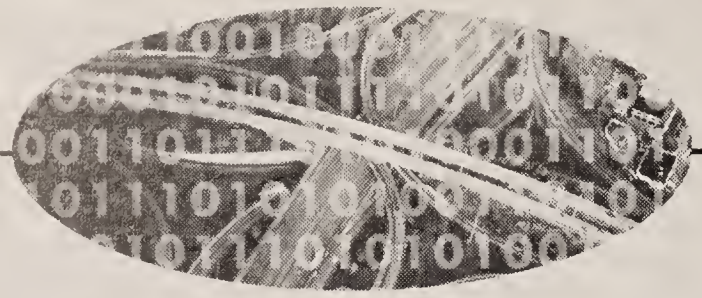

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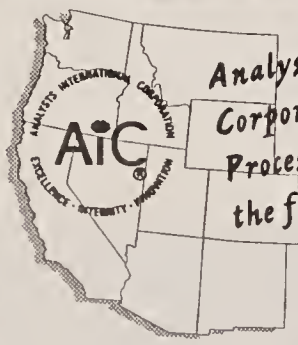

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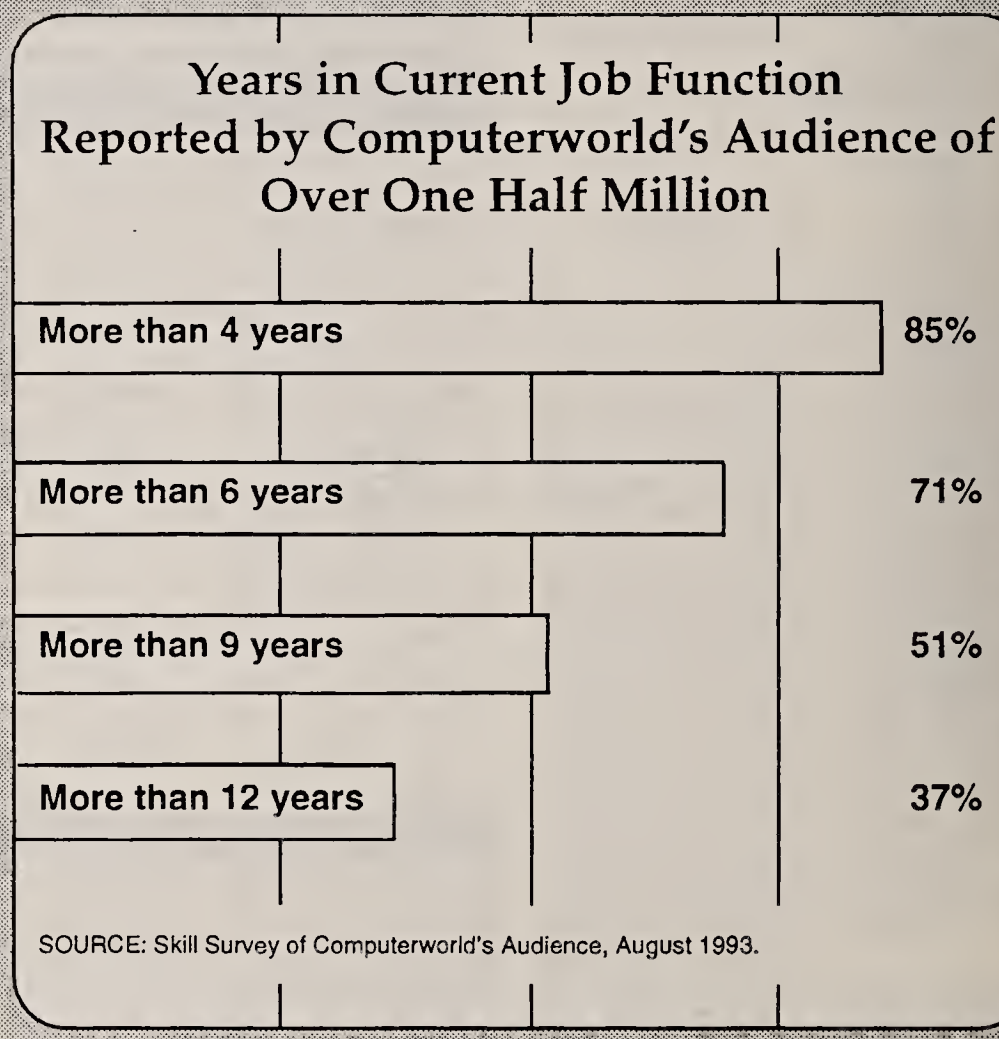

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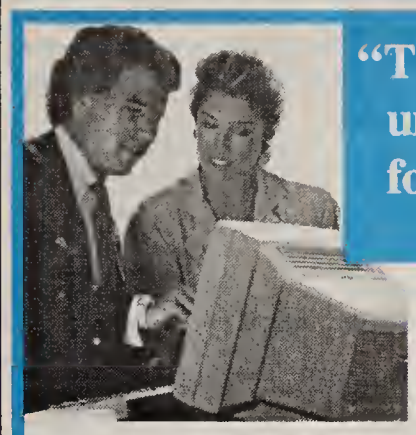

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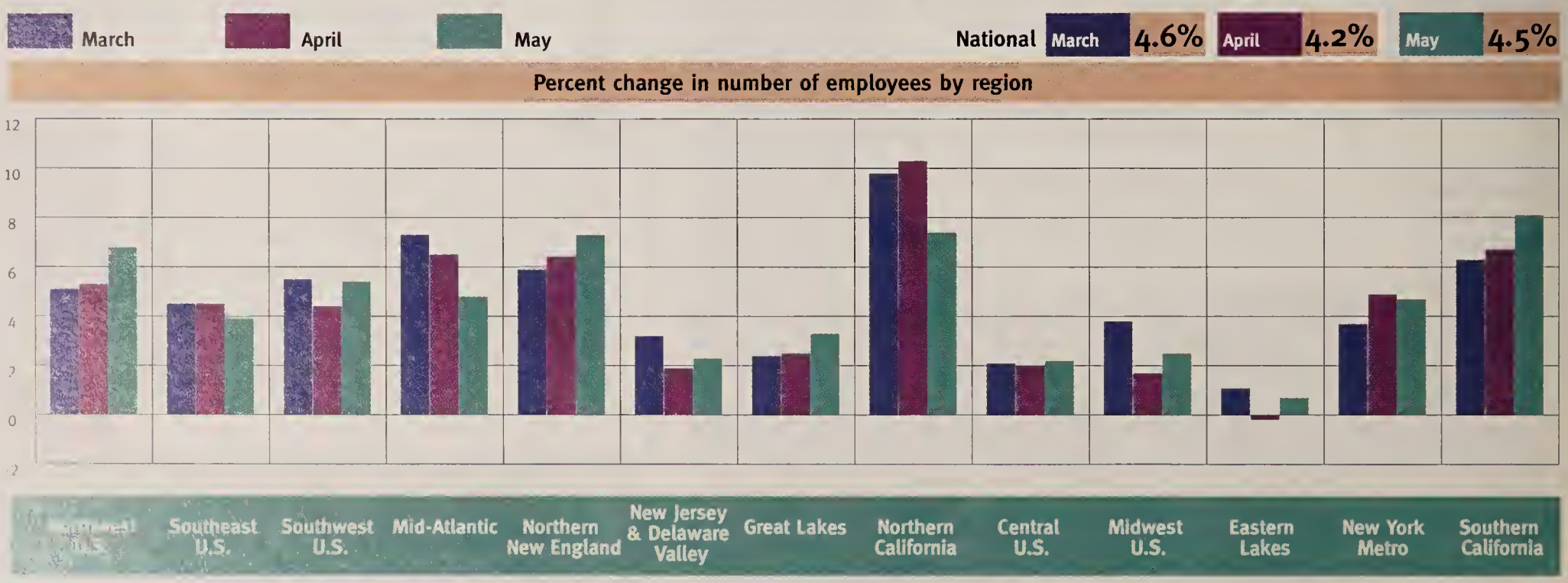

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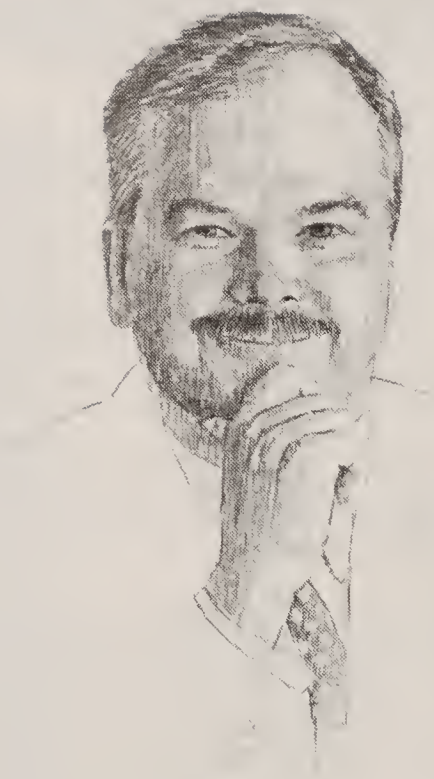

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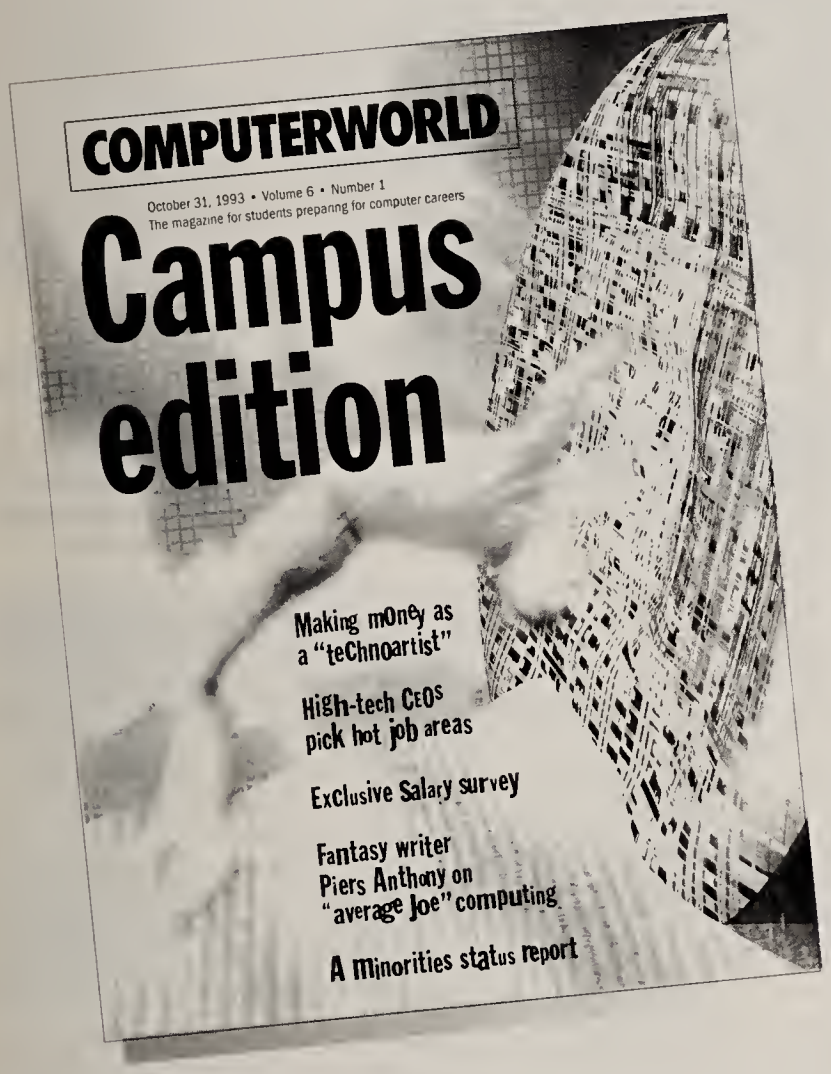

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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!

No Easy Ride

By Alan Radding

Several vendors are about to introduce Mosaic-based Internet access products, but don't expect an easy trip. Despite the new interfaces, finding what you need on the Internet will likely remain a challenge.

As millions of new drivers rush onto the Internet, most find they want a new dashboard for their vehicle and a better map.

The raw, often Unix-based, command-line interfaces they encounter take them back to the early days of DOS. Suddenly they find themselves facing a cryptic prompt, maybe just a percent sign, and the need to type arcane commands such as rz, nn or ls.

The Internet is anything but user-friendly. Software vendors and Internet access providers, however, are rushing a new generation of Internet interfaces to the market. They aim to replace Unix and VAX/VMS commands with point-and-click menus.

How you navigate the Internet is mainly determined by your access means: time-sharing or direct.

Time-sharing users access the Internet through a service provider such as Delphi Internet Services Corp. or America Online, Inc. as if they were a dumb terminal connected to a host. The host is connected to the Internet, runs the Internet information retrieval applications for you and receives the information back, which you download to your PC. The host also passes you through to other resources.

As a terminal user, you are limited to the interface that your access provider offers. This interface, however, is simply a front end to the host and not to the Internet itself. It works only when logged on to the host. As soon as the host connects you through to a data source on the Internet, you must wrestle with that server's interface.

If you don't know what to make of the interface, your friendly host front end probably can't help you. Still, most of the access providers are rushing to create a menu-driven or graphical front end to their services.

Delphi in Cambridge, Mass., for example, intends to introduce a graphical front end in the fall and has been bolstering its menu-driven interface in the interim. The graphical user interface "will add point-and-click access," says Rusty Williams, vice president and general manager at Delphi.

America Online is the first of the popular on-line services to offer full Internet connectivity along with a snazzy graphical interface. Still, the results are mixed: "We get a lot of nice icons, but once you get into something [on the Internet], the interface doesn't carry over," one user complains.

For users with a direct connection to the Internet, achieved via SLIP (Serial Line Internet Protocol) or PPP (Point-to-Point Protocol), the choices are better but still limited. "IP connections are not widely available, and they are not inexpensive," with prices from $500 to $3,000 per month, Williams says.

For those with an IP link and a big pipeline, Mosaic promises to become the Internet front end of choice. It is a protocol for accessing the Internet's World Wide Web using hypertext. It lets users work through a graphical windowed interface and click on icons to retrieve information from multiple servers.

To make it work, you must assemble the Mosaic presentation software, referred to as viewers or browsers, and other pieces. It's all free and available in various places on the Internet, but finding, downloading and integrating it is no trivial task.

For users who would rather pay than struggle, several vendors are about to introduce Mosaic-based Internet access products. But even these products don't really address the key challenge — knowing where and how to look for things on the Internet. "If you don't know where the pizza parlor is, you still can't get a pizza no matter how nifty the dashboard of your car," says Bruce Dern, author of *The Internet Guide for New Users* (McGraw-Hill). ■

Radding is a free-lance writer in Newton, Mass.

WHAT'S OUT THERE

If you're just getting started, you may want to check out some of the Mosaic-based Internet access products

Spry, Inc.
Internet-in-a-Box ($100)
Seattle

- Offers the basic array of Internet applications, including Telnet, Gopher and Mosaic, along with a reference guide to special interest Internet addresses based on *The Whole Internet User's Guide and Catalog.*

Quarterdeck Office Systems
Mosaic for Windows
(no price announced)
Santa Monica, Calif.

- Includes the National Center for Supercomputing Applications Mosaic software plus enhancements for faster performance, multimedia viewers and an improved user interface.

FRIENDLY ACCESS

If the prospect of wrestling with Unix commands or SLIP sounds unappealing, try the following approaches:

- Invite an Internet bigot to lunch. For the price of a pizza and a beer you can get tons of useful advice, if you can put up with the smugness.
- E-mail for help. Send an E-mail message to someone who can steer you to the right sources on the Internet.
- Cultivate a mentor. There are lots of patient, helpful people who are willing to assist, especially if you demonstrate appropriate respect for their beloved Internet.
- Go to the library. Many librarians are right in the thick of Internet activity. A good librarian is usually willing and able to help.

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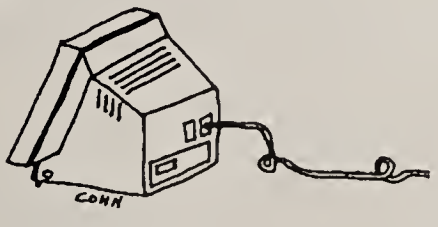

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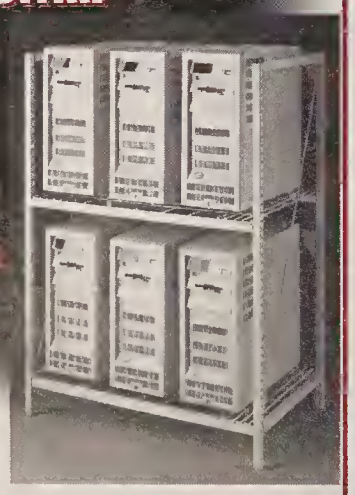

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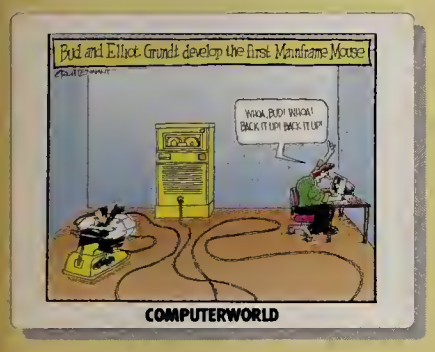

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Percent

Data Switch Corp.	38.2	Cheyenne Software Inc.(L)	-54.0
Ganoalf Technologies Inc.	25.0	Inacom Corp.(L)	-34.0
Easel Corp.	21.9	IPL Systems Inc.	-21.7
Convex Computer	21.6	American Power Conversion	-16.9
Cambex Corp.	20.6	Unisys Corp.	-15.3
Telebit Corp.	17.1	ViewLogic Systems	-15.0
Advanced Logic Research	14.7	Proteon Inc.	-13.3
General Datacomm Inos.	12.1	Chips and Technologies	-13.2

Dollar

Compuware Corp.	3.25	Cheyenne Software Inc.(L)	-9.38
Scientific Atlanta Inc.	3.00	Inacom Corp.(L)	-4.25
ITT Corp.	2.50	Newbridge Networks Corp.	-3.75
American Mgmt. Systems(H)	2.38	Powersoft	-3.50
Storage Technology	2.00	American Power Conversion	-3.50
Cray Research Inc.	2.00	Lotus Development	-3.31
Cabletron Systems(L)	2.00	Sprint Corp.	-3.25
3 COM Corp.	1.75	Xilinx	-3.13

Industry Almanac

The language of investment

One Wall Street watcher thinks **Globalink, Inc.** (GLNK) will soon translate into investment profits.

Globalink makes foreign language translation software that runs on PCs and Macintoshes. RAS Securities Corp. analyst Doug Carey recommends Globalink stock based on the company's innovative products and revenue momentum.

The company offers a high-end product, the Global Translation System, which translates scanned documents on a full-sentence basis rather than performing limited word- or phrase-based substitutions. Although it runs on desktop computers, the Global Translation System compares favorably to Systran Translation Systems, Inc.'s mainframe-based software, Carey said.

Rounding out the current product line are low-end and midrange Power Translator offerings, which can read and write WordPerfect Corp.'s WordPerfect documents, as well as text files. In addition, Globalink sells add-on dictionaries to handle specialized vocabularies for legal, medical, financial and other professions.

Carey noted that the company has other new products in the pipeline, including a software-based system that will use voice-recognition technology to teach users foreign languages, with the correct pronunciation.

To fulfill its stock market potential, Globalink must continue to spend heavily on sales and marketing, build up its revenue and then concentrate on "significant earnings growth" as it rolls into next year, Carey said. "The company is growing at a pretty good clip," he said.

—Derek Slater

The facts

Globalink, Inc.
Fairfax, Va.
Established: 1988

Revenue		Earnings per share	
1992	$3.6M	1992	$0.09
1993	$6.8M	1993	$0.10
1994	$15M *	1994	$0.30*
1995	$28M *	1995	$0.90*

* Estimates

Source: RAS Securities Corp., New York

Exch	52-Week Range			June 17 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**UP 0.80%**
OTC	63.75	19.63	3 COM Corp.	46.00	1.75	4.0
NYS	45.56	36.25	AMERITECH Corp.	41.25	0.13	0.3
NYS	65.00	49.50	AT&T	56.63	1.25	2.3
OTC	26.50	13.00	Banyan Systems Inc.	14.50	-1.25	-7.9
NYS	69.13	49.00	Bell Atlantic Corp.	55.50	-0.75	-1.3
NYS	63.88	53.00	Bellsouth Corp.	61.13	-0.88	-1.4
NYS	21.50	6.25	Bolt, Beranek & Newman	12.50	0.13	1.0
OTC	15.75	9.50	Brooktrout Technology	12.00	0.00	0.0
NYS	132.50	82.63	Cabletron Systems (L)	89.25	2.00	2.3
OTC	43.00	17.75	Centigram Communications	21.75	-0.75	-3.3
OTC	60.25	34.25	Chipcom Corp. (L)	35.25	0.25	0.7
OTC	40.75	20.13	Cisco Systems Inc.	24.38	1.00	4.3
OTC	18.38	9.25	Compression Labs Inc.	11.25	0.25	2.3
OTC	12.38	6.25	Computer Network Tech.	6.94	-0.19	-2.6
OTC	33.75	8.50	CrossComm	9.50	0.13	1.3
OTC	3.38	1.50	Data Switch Corp.	2.94	0.81	38.2
OTC	36.56	19.00	DSC Communications	20.69	-0.56	-2.6
OTC	3.50	0.50	Gandalf Technologies Inc.	0.63	0.13	25.0
NYS	17.63	8.00	General Datacomm Inos.	16.25	1.75	12.1
NYS	39.88	29.50	GTE Corp.	31.75	-0.13	-0.4
NYS	95.97	76.97	ITT Corp.	85.50	2.50	3.0
OTC	29.88	21.38	MCI Communications Corp.	23.63	-0.75	-3.1
OTC	7.75	1.50	Microcom Inc.	6.13	0.38	6.5
OTC	23.50	11.50	NetManage Inc.	13.63	-0.38	-2.7
OTC	7.25	3.50	Netrix Corp.	5.00	0.00	0.0
OTC	10.25	4.25	Network Computing Devices	4.25	-0.25	-5.6
NYS	11.13	6.63	Network Equipment Tech.	8.38	0.38	4.7
OTC	23.38	8.88	Network General	17.88	0.38	2.1
OTC	9.88	6.38	Network Systems Corp.	6.88	0.13	1.9
OTC	73.88	35.25	Newbridge Networks Corp.	35.25	-3.75	-9.6
NYS	37.50	21.38	Northern Telecom Ltd.	30.50	-0.50	-1.6
OTC	28.00	15.38	Novell Inc.	15.75	-1.19	-7.0
NYS	48.88	33.25	Nynex Corp.	38.13	-0.75	-1.9
OTC	30.00	18.50	Octel Communications Corp. (L)	19.00	-0.75	-3.8
OTC	18.25	9.00	Optical Data Systems Inc.	14.25	-0.25	-1.7
OTC	7.50	3.63	Penril Data Comm Networks (L)	3.63	-0.25	-6.5
OTC	27.25	10.00	Picturetel Corp.	14.19	1.06	8.1
OTC	8.25	3.63	Proteon Inc.	4.88	-0.75	-13.3
OTC	14.38	5.88	Racotek Inc.	7.00	0.25	3.7
NYS	38.88	24.88	Scientific Atlanta Inc.	37.75	3.00	8.6
NYS	47.00	36.75	Southwestern Bell Corp.	43.13	-0.25	-0.6
NYS	40.25	31.38	Sprint Corp.	35.75	-3.25	-8.3
OTC	26.75	14.50	Standard Microsystems Corp.	15.75	-1.38	-8.0
OTC	23.75	11.25	Stratacom Inc.	21.75	-0.75	-3.3
OTC	40.75	15.50	Synoptics Communications	16.06	-0.44	-2.7
OTC	15.25	2.88	Telebit Corp.	6.00	0.88	17.1
OTC	46.00	21.25	US Robotics	26.75	-1.00	-3.6
NYS	50.75	38.25	US West Inc.	41.75	-0.13	-0.3
OTC	43.88	19.38	Wellfleet Communications	24.63	0.13	0.5
OTC	28.25	13.50	Xircom	16.00	-0.25	-1.5
OTC	30.00	13.75	Xyplex Inc.	13.75	-0.63	-4.3
PCs and Workstations						**OFF 0.81%**
OTC	7.50	2.63	Advanced Logic Research	5.38	0.69	14.7
OTC	45.25	22.00	Apple Computer Inc.	26.13	-1.00	-3.7
OTC	33.00	13.75	AST Research Inc.	14.25	-0.88	-5.8
NYS	39.88	14.38	Compaq Computer Corp.	33.50	-1.75	-5.0
OTC	30.75	13.50	Dell Computer Corp.	25.75	-2.00	-7.2
OTC	25.00	12.38	Gateway 2000 Inc.	13.63	-0.50	-3.5
NYS	93.63	64.38	Hewlett Packard Co.	78.13	1.63	2.1
NYS	26.88	16.00	Silicon Graphics	20.13	-0.50	-2.4
OTC	31.38	19.50	Sun Microsystems Inc. (L)	20.50	0.25	1.2
NYS	50.75	28.13	Tandy Corp.	36.38	0.25	0.7
OTC	5.13	2.38	Zeos International Ltd.	2.50	0.00	0.0
Large Systems						**OFF 1.79%**
ASE	7.88	4.38	Amdahl Corp.	6.25	-0.25	-3.8
NYS	7.63	3.63	Convex Computer	5.63	1.00	21.6
OTC	4.50	0.50	Cray Computer	1.09	-0.09	-7.9
NYS	33.75	19.13	Cray Research Inc.	23.13	2.00	9.5
NYS	10.75	6.63	Data General Corp.	7.50	0.00	0.0
NYS	43.13	18.25	Digital Equipment Corp.	19.75	-0.38	-1.9
NYS	52.25	36.38	Harris Corp.	47.00	-0.13	-0.3
NYS	65.00	40.63	IBM (H)	62.63	0.00	0.0
OTC	18.75	8.25	NetFrame	9.75	-0.50	-4.9
OTC	26.00	5.00	Parallan Computer	5.00	-0.75	-13.0
OTC	23.25	6.50	Pyramid Technology	7.25	0.00	0.0
OTC	20.00	11.13	Sequent Computer Sys.	14.88	-0.06	-0.4
OTC	6.84	1.75	Sequoia Systems Inc.	3.38	-0.38	-10.0
NYS	33.25	20.25	Stratus Computer Inc.	29.88	0.25	0.8
NYS	16.38	8.50	Tandem Computers Inc.	12.38	-0.38	-2.9
OTC	30.00	9.75	TriCoro Systems	13.00	-0.25	-1.9
NYS	16.50	9.00	Unisys Corp.	9.00	-1.63	-15.3
Software						**OFF 1.62%**
OTC	34.50	16.25	Adobe Systems Inc.	26.50	-1.00	-3.6
OTC	34.50	13.50	Alous Corp.	25.38	-0.13	-0.5
OTC	8.38	4.50	American Software Inc.	5.25	0.13	2.4
OTC	15.75	6.75	Ask Computer Systems	13.00	0.00	0.0
OTC	61.75	37.00	Autodesk Inc.	48.00	-1.75	-3.5
OTC	4.50	2.00	Bachman Info. Systems (L)	2.00	-0.13	-5.9
OTC	34.00	20.50	BGS Systems Inc.	25.00	1.00	4.2
OTC	71.00	44.50	BMC Software Inc.	50.13	-1.88	-3.6
OTC	30.75	22.50	Boole & Babbage (H)	30.00	1.00	3.4
OTC	24.75	8.50	Borland Int'l Inc.	8.94	-0.06	-0.7
OTC	25.00	9.50	Brock Control Systems Inc.	21.00	-1.00	-4.5
OTC	4.63	2.38	CE Software	3.13	0.00	0.0
ASE	30.34	8.00	Cheyenne Software Inc. (L)	8.00	-9.38	-54.0
OTC	14.25	6.50	Cognos Inc.	11.88	0.13	1.1
NYS	44.88	27.00	Computer Associates	39.75	-0.38	-0.9
NYS	5.38	2.13	Computervision Corp.	3.25	0.00	0.0
OTC	48.25	21.00	Compuware Corp.	42.75	3.25	8.2
OTC	14.00	5.75	Comshare Inc.	12.38	-0.63	-4.8
OTC	25.00	7.63	Corel Corp.	22.25	-1.31	-5.6
OTC	7.75	3.38	Easel Corp.	4.88	0.88	21.9
OTC	29.25	11.00	Filenet Corp.	21.75	0.00	0.0
OTC	25.00	4.50	4th Dimension	4.75	-0.50	-9.5
OTC	12.50	5.25	Frame Technology	10.50	0.38	3.7
OTC	13.00	7.00	Group I Software	7.00	0.00	0.0
OTC	31.75	9.75	Gupta (L)	11.88	1.13	10.5
OTC	12.00	7.38	Hogan Systems Inc.	10.63	0.38	3.7
OTC	29.50	16.00	IMRS	24.50	-0.63	-2.5
OTC	44.75	12.50	Information Resources	15.25	0.50	3.4
OTC	27.25	14.25	Informix Corp.	15.50	-1.50	-8.8
OTC	12.38	8.50	Intergraph Corp.	9.25	-0.06	-0.7
OTC	8.88	4.88	Interleaf Inc.	5.75	-0.38	-6.1
OTC	15.50	4.75	Intersolv Inc.	11.38	-0.38	-3.2
OTC	50.00	27.00	Intuit Inc.	33.50	1.25	3.9
OTC	18.75	8.00	Knowledgeware Inc.	8.50	-0.25	-2.9
OTC	37.00	15.50	Legent Corp.	29.00	-1.25	-4.1
OTC	86.50	30.25	Lotus Development	51.75	-3.31	-6.0
OTC	18.50	8.25	Magic Software Enterprises (L)	8.63	0.13	1.5
OTC	18.50	6.00	Manugistics Group Inc.	8.50	0.75	9.7
OTC	10.00	3.63	MathSoft	4.25	-0.25	-5.6
OTC	11.25	4.50	McAfee Associates	7.75	0.00	0.0
OTC	17.25	8.38	Mentor Graphics	11 38	1.00	9.6
OTC	33.50	11.50	Micro Focus	17.75	-0.38	-2.1
OTC	11.63	4.75	Micrografx Inc.	6.75	0.63	10.2
OTC	54.63	35.19	Microsoft Corp.	53.25	0.50	0.9
OTC	38.25	21.19	Oracle Corp.	36.44	0.19	0.5
OTC	44.75	23.75	Parametric Technology	26.50	0.13	0.5
OTC	24.50	15.50	ParcPlace Systems Inc.	17.00	-1.50	-8.1
OTC	41.38	26.00	Peoplesoft	32.50	-1.00	-3.0
OTC	6.25	3.50	Phoenix Technologies	5.00	0.00	0.0
OTC	69.50	24.25	Powersoft	50.75	-3.50	6.5
OTC	39.75	3.50	Platinum Software	5.94	0.00	0.0
OTC	14.75	7.25	Platinum Technology	13.13	0.38	2.9
OTC	60.25	30.50	Progress Software Corp. (L)	31.25	-1.25	-3.8
OTC	4.13	1.94	Quarterdeck Office Sys. (H)	3 69	-0.31	-7.8
OTC	32.00	13.00	Rainbow Technologies Inc.	13.25	-0.50	-3.6
OTC	11.38	4.00	Rasterops	4.88	0.50	11.4
OTC	14.50	3.75	Ross Systems	4.13	-0.13	-2.9
OTC	28.75	3.88	Sapiens Intl. Corp. N.V.	4.25	-0.13	-2.9
OTC	14.63	9.75	Softkey International Inc. (H)	12.88	-0.88	-6.4
OTC	8.63	3.75	Software Publishing Corp.	4.94	-0.44	-8.1
OTC	13.75	5.00	State of the Art (L)	5.75	-0.25	-4.2
NYS	35.63	17.63	Sterling Software Inc.	34.00	0.75	2.3
OTC	21.63	9.13	Struct. Dynamics Research	10.63	0.94	9.7
OTC	57.00	25.75	Sybase Inc. (H)	51.25	-1.25	-2.4
OTC	20.50	10.88	Symantec Corp.	11.75	-1.13	-8.7
OTC	52.75	33.75	SynOpsys	37.25	-2.88	-7.2
OTC	24.25	11.75	System Software Assoc.	14.13	-0.88	-5.8
OTC	6.75	2.88	Trinzic Corp.	4.13	-0.25	-5.7
OTC	30.00	16.50	ViewLogic Systems	17.00	-3.00	-15.0
OTC	13.25	5.50	Walker Interactive Systems	9.25	0.00	0.0
OTC	60.00	17.50	Wall Data Inc.	38.00	0.13	0.3
Semiconductors						**OFF 1.76%**
NYS	32.75	16.75	Advanced Micro Devices	25.88	-0.88	3.3
NYS	31.13	18.63	Analog Devices Inc.	28.63	1.25	4.6
OTC	29.63	10.94	Atmel Corp.	25.50	-1.38	-5.1
OTC	7.50	3.38	Chips and Technologies	4.13	-0.63	-13.2
OTC	44.63	15.75	Cirrus Logic	30.50	-0.75	-2.4
NYS	19.88	11.25	Cypress Semiconductor Corp.	17.63	0.75	4.4
NYS	20.13	13.00	Dallas Semiconductor	18.75	-0.63	-3.2
OTC	27.75	19.25	Integrated Silicon Systems	20.00	-1.00	-4.8
OTC	74.50	49.25	Intel Corp.	59.50	-0.38	-0.6
NYS	26.38	13.00	LSI Logic Corp.	23.75	0.00	0.0
OTC	26.75	12.25	Lattice Semiconductor	18.50	0.63	3.5
NYS	39.91	13.25	Micron Technology	33.88	0.75	2.3
NYS	54.88	40.44	Motorola Inc.	47.13	1.25	2.7
NYS	25.00	14.38	National Semiconductor	18.63	-1.25	-6.3
OTC	10.13	6.50	Sierra Semiconductor	8.63	0.56	7.0
NYS	89.50	55.75	Texas Instruments	78.00	1.13	1.5
OTC	18.88	7.63	VLSI Technology	13.88	-0.75	-5.1
OTC	14.38	3.38	Weitek	4.00	-0.25	-5.9
ASE	20.38	3.63	Western Digital Corp.	12.63	-1.13	-8.2
OTC	59.75	29.75	Xilinx	36.50	-3.13	-7.9
OTC	40.75	23.75	Zilog Inc.	34.50	1.00	3.0
Peripherals and Subsystems						**OFF 0.71%**
OTC	30.50	16.63	American Power Conversion	17.25	-3.50	16.9
OTC	24.75	17.13	Banctec Inc.	21.38	-0.13	-0.6
OTC	7.75	3.25	Cambex Corp.	5.13	0.88	20.6
ASE	7.88	2.63	Cognitronics Corp.	3.00	0.00	0.0
NYS	20.50	9.00	Conner Peripherals	13.00	-0.88	-6.3
OTC	19.63	8.75	Creative Technologies Inc.	17.63	-0.38	-2.1
OTC	19.75	4.75	Data Race Inc.	6.50	0.63	10.6
ASE	10.75	4.13	Dataram Corp.	4.25	-0.13	-2.9
NYS	23.00	9.13	EMC Corp.	14.50	0.00	0.0
OTC	8.25	3.13	Emulex Corp.	6.88	0.50	7.8
OTC	21.00	14.25	Evans & Sutherland	15.50	0.50	3.3
OTC	22.50	7.50	Exabyte	15.75	-0.25	-1.6
OTC	34.00	5.75	Intelligent Info. Systems	5.75	-0.50	-8.0
OTC	4.38	2.00	Iomega Corp.	2.50	0.25	11.1
OTC	9.75	4.50	IPL Systems Inc.	4.50	-1.25	-21.7
OTC	28.50	13.75	Komag Inc.	18.75	-1.00	-5.1
OTC	8.63	4.38	Maxtor Corp.	5.63	-0.25	-4.3
OTC	8.75	4.88	Micropolis Corp.	5.75	0.38	7.0
OTC	22.50	10.00	Pinnacle Micro Inc.	16.00	0.00	0.0
OTC	9.75	6.25	Printronix Inc.	9.75	0.00	0.0
NYS	11.75	7.38	QMS Inc.	7.63	-0.25	-3.2
OTC	20.25	9.38	Quantum Corp.	13.38	-0.44	-3.2
OTC	9.13	3.63	Radius Inc.	4.50	-0.56	-11.1
NYS	17.75	8.38	Recognition International	9.00	-0.13	-1.4
OTC	6.88	3.63	Rexon Inc.	6.25	0.38	6.4
OTC	28.75	14.88	Seagate Technology	21.63	-0.63	-2.8
NYS	41.63	23.75	Storage Technology	32.25	2.00	6.6
NYS	33.38	21.38	Tektronix Inc.	28.38	-0.13	-0.4
NYS	104.88	69.88	Xerox Corp.	100.00	-2.75	-2.7
Services						**OFF 2.1%**
OTC	24.75	14.88	American Mgmt. Systems (H)	24.75	2.38	10.6
NYS	4.25	2.38	Anacomp Inc.	3.13	-0.13	-3.8
OTC	23.50	14.50	Analysts Int'l	17.00	0.75	4.6
NYS	56.88	46.88	Auto Data Processing	54.88	1.00	1.9
OTC	18.25	9.25	Cambridge Tech. Partners	16.38	-0.50	3.0
NYS	25.13	14.00	Ceridian Corp. (H)	24.75	0.75	3.1
NYS	24.25	14.00	Comdisco Inc.	20.13	-0.63	-3.0
OTC	12.50	4.84	Computer Horizons	9.00	-0.25	-2.7
NYS	44.00	25.84	Computer Sciences	43.00	0.88	2.1
NYS	9.13	6.00	Computer Task Group	9.13	0.13	1.4
NYS	34.75	8.88	CompUSA Inc. (L)	9.00	-0.25	-2.7
OTC	13.50	7.75	Control Data Systems Inc.	10.13	-0.88	-8.0
OTC	11.00	6.63	Egghead Discount Software	7.13	-0.13	-1.7
NYS	38.00	26.00	General Motors E (EDS)	35.13	1.50	4.5
OTC	22.75	7.50	Inacom Corp. (L)	8.25	-4.25	-34.0
OTC	28.00	12.25	Intelligent Electronics	18.31	0.56	3.2
OTC	22.50	8.00	Merisel (L)	9.63	-0.63	6.1
OTC	32.50	8.66	Microage Inc	20.75	-1.25	-5.7
OTC	40.50	25.66	Paychex	31.50	-2.00	6.0
NYS	39.75	21.63	Policy Management Sys	34.25	0.63	1.9
NYS	25.50	18.00	Reynolds and Reynolds (H)	24 13	-0.50	-2.0
OTC	28.50	15.25	SEI Corp.	19 00	-1.00	-5.0
OTC	29.38	17.50	Shared Medical Systems	25.25	0.75	3.1
OTC	11.13	5.63	SHL Systemhouse	6.63	-0.75	10.2
OTC	30.75	9.25	Software Spectrum Inc (L)	10.25	0.00	0.0
OTC	42.75	29.25	Sungard Data Systems	36.50	-0.50	1 4

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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FDA seeks RX

CONTINUED FROM PAGE 1

tors, ventilators and heart monitors. The problem came to light at Children's Memorial Hospital in Chicago where a child's ventilator malfunctioned whenever the parent used a cellular phone nearby.

Most reports of dangerous incidents have focused on cellular phones and two-way radios, but some experts fear the problem will only get worse with the expected proliferation of devices such as wireless modems, powerful PCs with clock speeds of 100 MHz, handheld digital assistants and wireless LANs.

"The air is getting thicker with transmissions of electromagnetic signals, so the threat to medical devices is greater," said Bennett Kobb, an independent consultant on wireless policy in Arlington, Va. "Medical device manufacturers must respond by making their products more robust, or there will be hell to pay."

Kobb said the Federal Communications Commission regulates emissions from computing devices — mostly to prevent interference with television sets and aircraft radios — but may need to consider testing for adverse effects on medical devices as well.

Precautions necessary

John Glaser, vice president of information systems at Brigham and Women's Hospital in Boston, said his hospital's clinical engineering department performs rigorous emissions testing on all computer systems before installation. He called testing the "prudent" thing to do to avoid both harm to patients and lawsuits. "Don't presume that the vendor's [emission] specification is correct," he cautioned.

One hospital that has banned cellular phones is St. Margaret Mercy Healthcare Centers in Hammond, Ind. But Terrance Clemans, manager of clinical engineering there, said computers and personal communications services are too low-powered to cause interference.

Vendors on both sides of the problem have taken some preliminary steps. The Washington-based Cellular Telecommunications Industry Association last month created a research center on electromagnetic compatibility at the University of Oklahoma, and the Association for the Advancement of Medical Instrumentation in Arlington, Va., has formed an electromagnetic standards committee.

Interference woes

Electromagnetic interference incidents between 1979 and 1993 include:

- At least two patients died after their patient monitoring systems were disabled by interference.
- Displays on a patient monitor "flatlined" whenever a paging company transmitted digital control information to remote sites.
- A fetal heartbeat detector picked up radio and citizens band broadcasts.
- A ventilator experienced keyboard lockup due to interference from a guard's walkie-talkie.

Source: Jeffrey L. Silberberg, FDA, Rockville, Md.

IBM adds EISA server to PS/2 family

By Jaikumar Vijayan

Weeks after the IBM PC Co. announced its first stand-alone EISA-based PC server, the company last week added two Micro Channel Architecture systems to its PS/2 family.

At the same time, IBM dropped prices on several other PS/2 models by up to 20%.

The new PS/2 76 and 77 systems, which are based on Intel Corp. 1486 processors, top out with a 100-MHz DX4-based system featuring Pentium Overdrive Processor upgradability. Prices start at $2,365 for a PS/2 76 with a 170M-byte hard drive, 8M bytes of RAM and a choice of OS/2 or DOS.

Analysts and users welcomed the announcements, which they said were long overdue.

"IBM is belatedly waking up to the fact that Compaq [Computer Corp.] is walking off the playing field with the server marketplace just when it seems to be taking off," said Peter Kastner, vice president at Aberdeen Group in Boston. "IBM really needed to jump-start its server business."

But it could take some time for IBM to regain lost ground, some users predicted.

Chad Pearce, vice president of systems at Godwins, Booke and Dickenson in Philadelphia, is a former IBM user who now runs a nearly all-Compaq shop. He switched because he wanted to have "more nonproprietary hardware."

"The thing that plagued us in the past about IBM wasn't really the cost," as much as compatibility with other hardware and standards, Pearce said. He said he hopes IBM's new machines would be a move toward a more industry-standard architecture. Some features of the new PS/2s include the following:

- A new VESA local bus graphics chip on the system board.
- Full-screen, full-motion video using a board-based feature called Mediaburst.
- An error-detection function for LAN systems that provides error and configuration information from problem systems.

Trio teams to create 64M-byte DRAM chip. See page 44.

Nightmare

CONTINUED FROM PAGE 1

and remote users dialing in all night, LAN backup has hit a crisis point, according to observers.

With operations running all the time, "we miss files," said a LAN administrator who manages 120G bytes of storage at an employment agency in Michigan and who requested anonymity.

Open files are not the only problem. Users face an increasingly shrinking window of time to complete backups. Solutions such as higher-performance tape drives are on the horizon, said Fara Yale, an analyst at Dataquest, Inc. But speed improvements are being outstripped by disk capacities as the data that can be stored on one platter doubles every 15 months, according to International Data Corp.

Time crunch

The Michigan firm has maximized performance by writing to two tapes at once with the help of a carousel that holds 54 8mm tapes. But that solution will not last for long, the administrator said. By this time next year the company will have nearly twice the amount of data on the network.

The time crunch leads most firms to do full backups just once per week or month, with incremental backups done each night.

Many analysts recommend that strategy, but "restoration is infinitely easier when you do a full backup every night," said Bob Weber, a private consultant in Los Angeles.

A third problem is unreliability, which is primarily caused by human error. "LAN backup fails regularly: an average of twice a week," said Michael Peterson, an analyst at Peripheral Strategies, Inc. in Santa Barbara, Calif. Compare that, he said, with once a year in mainframe environments.

> **"There really needs to be a whole systems approach to protecting the data."**
> —Dan Friedman, consultant

Others said they have experienced problems with the tape media itself.

John Williams, a consultant at HCM, Inc. in Nashville, can attest to that. When a client blew out a database, "I thought, no problem, I'll just restore." When that did not work, Williams had to manually restore the data, which cost him the equivalent of a week's labor. As it turned out, he said, "The vendor that sold me the drive hadn't quite gotten the drive certified yet."

Today, Williams uses Digital Linear Tape (DLT) with Cheyenne Software, Inc.'s Arcserv, which backs up 80% of his 16G-byte server in a couple of hours. DLT technology promises a speed of 1.5M byte/sec. and high reliability. Tape backup vendors are also working out the speed problem by offering systems that stream data in parallel to more than one tape drive, Yale said.

Epoch Systems, Inc. said it is working with Oracle Corp. and Sybase, Inc. to solve the database backup dilemma. Epoch and others will support backup utilities for open databases that Oracle and Sybase will ship in the next versions of their databases.

So as mainframe-class applications reach down to Novell, Inc. NetWare-based LANs, mainframe-class backup capabilities are slowly finding their way to these environments. For instance, some users in large distributed environments are turning to the likes of IBM, Epoch, Computer Associates International, Inc. and Legent Corp. for automated storage management systems that reach into PC LAN or Unix networks and back up data to a Unix server or mainframe.

Less painful backup

Prior to using such a system from New Era Systems Services Ltd. in Calgary, Alberta, "the manual labor to back up and restore data was terrible," said Lynne Bryant, manager of telecommunications systems management at The Insurance Corp. of British Columbia in North Vancouver. Now operators click an icon and go home, she said. And since these systems save only changed data, they can reduce backup time by 30% to 40%, Peterson said. At the same time, they were designed to provide restores that look as though a full backup had been performed.

Implementation of such systems can be time-consuming, and none of them are cheap. A New Era system costs $25,000; clients cost $250 each. Today, typical licenses for such products cover 1,000 to 2,000 clients, Peterson said.

Bright ideas

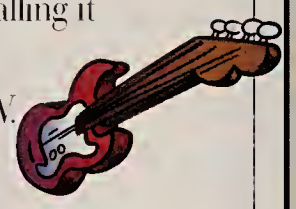
The picture for LAN backup is not completely dim. Some solutions include the following:

- **Enterprise data management systems:** These automated systems back up PC LAN data to Unix servers or mainframes. IBM, Legent, Epoch and Computer Associates are among the 17 or so providers, said Michael Peterson, an analyst at Peripheral Strategies.
- **Software mirroring:** Data is transmitted over a high-speed network to a remote server for redundancy and disk storage. Tape backups are still necessary.
- **Tape arrays:** New versions of backup software allow you to use more than one tape simultaneously.
- **Data servers:** High-speed systems, available mainly in the Unix arena, specialize in storing data.
- **Superservers:** Superserver vendors such as NetFrame Systems, Inc. are providing speedy server-based backup/restore systems.
- **Hierarchical storage management:** Because inactive files are moved off the server, there is less to back up. —*Mary Brandel*

Wysiwyg

The Top 10 things you'll want to do if you travel back in time

10. Buy the patents from Xerox PARC.
9. Talk Charles Tandy out of calling it Radio Shack.
8. Skip the PC and invent MTV.



7. Get Apple to skip Lisa.
6. Get Texas Instruments to skip PCs altogether.
5. Sell Northgate, WordStar and Ashton-Tate to Michael Milken.
4. Talk Adam Osborne out of doing his own press conferences.
3. Buy skiing insurance on Fred Gibbons, former CEO, Software Publishers Corp.
2. Convince Sheldon Adelson that there should be only one Comdex; in Bermuda.
1. Beat Bill Gates to DOS.

Source: Newstips, Inc.

Great names

Kirk Hacker
Production manager/ programmer, Tronitech, a computer output microfiche firm, Grand Rapids, Mich.

Unusual user requests

"One user requested that we provide her with some way to enter a purchase order number into a purchase order tracking database in the event the system goes down. That's kind of like having an engine with no gas."

Source: Rick Powell, database administrator, Wesson Taylor and Wells, Warner Robins, Ga.

Smart move?

"The title for Big Dummy's Guide to the Internet ... has been changed to Everybody's Guide to the Internet."

Notice sent with the MIT Press' Fall 1994 book catalog

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Inside Lines

I'll scratch your back ...

Oracle CEO Larry Ellison praised California Gov. Pete Wilson's support of a deregulated phone industry at the dedication ceremony of a new $37.5 million office complex for Oracle last week. In turn, Wilson, who is battling Democratic candidate Kathleen Brown for governorship of the debt-ridden state, hailed Oracle as "a leader in new ideas and new industries" and promptly appointed Ellison co-chairman of a council intended to push California into the information age.

Deregulating telephone companies, incidentally, would knock down one barrier to popularizing interactive electronic services, a market Oracle badly wants to enter with its Media Server database technology for video-on-demand and home shopping.

Delusions of delivery

A large corporate user in the Rust Belt says he just got his first 24 ThinkPad 755CS notebooks from IBM and has been promised another 24 or so by the end of the month. Trouble is, he was expecting 300. Keep in mind that the 755CS is the one IBM says it can deliver — the passive-matrix color unit is supposed to ease demand pressure on its badly constrained active-matrix color ThinkPads. "They're going to drive us to dual vendors," the user said.

LAN servers ahoy

Look for IBM to officially announce the next version of its LAN Server this week, presumably with the long-awaited DCE-based enterprise directory, security and naming services. IBM is also lining up enhancements for its NetView/6000 family, including SNMP-based application management of LANs and SNA management.

FYI: DB2 NLM not ASAP

IBM still includes Novell's NetWare among the platforms due to be supported by the DB2 database, but Janet Perna, workstation database technology guru at IBM, said the computer giant has no firm plans at this point to actually build a DB2 NetWare Loadable Module (NLM). "It's one of the things that I keep monitoring, but I really don't hear the customer requirement for an NLM database server," she said. A promised version of DB2 for Microsoft's Windows NT is slated for beta shipments by year's end, Perna added.

Let the parity begin

EMC Corp. plans to introduce its first RAID Level 5 storage product this week: a new version of its Harmonix disk array for the AS/400 that will be compatible with IBM's 9337 subsystem and have a capacity of up to 157.4G bytes. Prices for EMC's HX3SR product start at $30,900 for a non-RAID configuration with 2G bytes of disk space and 6M bytes of cache.

High priority

Ian Diery, general manager of Apple's personal computer division, last week said he recognizes a pressing need for Apple and IBM to agree on a common PowerPC standard. Acknowledging that users are confused over their divergent paths, Diery said, "It's in our interest to get this out as soon as possible." He added that IBM and Apple are "working diligently" toward that end but declined to say when the two companies might reach agreement. The top exec also said Apple plans to offer faster Windows emulation on the Power Macintosh by the end of the year.

Grace Slick and the crew from The Jefferson Airplane are keeping their lawyers buzzing with a suit filed last week against California-based Berkeley Systems, Inc. The middle-aged rockers claim that the flying toasters used in the company's After Dark screen saver program were snatched from the cover art on their 1973 album "30 Seconds Over Winterland." But the Berkeley nerds who designed the program in 1989 apparently are not fans. Join the club. Or at least get in touch with Computerworld *about news items or tips by calling our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.*

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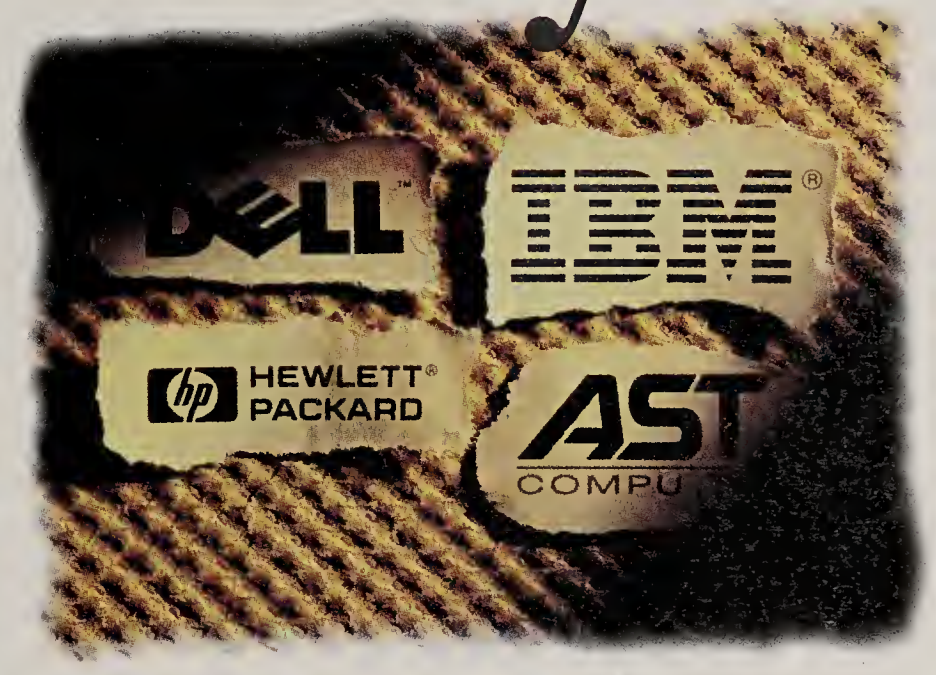

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